







Digitized by the Internet Archive  
in 2014

<https://archive.org/details/annualreportofne1977newy>



# New York Zoological Society/Annual Report 1977

"For it was never intended, from the beginning, that the Zoological Society's interests should be bounded by the fences around the Zoo and the Aquarium."

LIBRARY - NEW YORK  
ZOOLOGICAL SOCIETY

MAR 21 1978

Fairfield Osborn  
President, 1940-1968  
New York Zoological Society



*Cover: A herd of elephants crosses the plains of Kenya's Amboseli National Park. During 1977, a contract between the New York Zoological Society and the Government of Kenya was completed that resulted in the gazetting and better protection of this national park—the forty-second wildlife reserve established as a result of NYZS programs.*

**Photo credits** *Cover (and pages 22-23): William G. Conway; page 20: Klaus D. Kallman; page 21: Eleanor A. Morales. All other photographs by Bill Meng and Dennis DeMello, NYZS photographers.*

---

**New York Zoological Society**  
**Annual Report 1977**

---

<b>Report of the President</b> .....	3
<b>Report of the General Director</b> .....	5
<b>New York Zoological Park</b> .....	11
<i>Department of Mammalogy</i>	
<i>Department of Ornithology</i>	
<i>Department of Herpetology</i>	
<i>Department of Animal Health</i>	
<i>Department of Exhibition and Graphic Arts</i>	
<b>Wildlife Survival Center</b> .....	17
<b>New York Aquarium</b> .....	18
<b>Osborn Laboratories of Marine Sciences</b> .....	20
<b>International Field Science and Conservation</b> .....	22
<i>Center for Field Biology and Conservation</i>	
<i>Department of Conservation</i>	
<i>Field Projects Around the World</i>	
<b>Education</b> .....	26
<i>New York Zoological Park</i>	
<i>New York Aquarium</i>	
<i>Friends of the Zoo</i>	
<b>Administrative Services</b> .....	27
<i>Development and Membership Programs</i>	
<i>Personnel Department</i>	
<i>Department of Publications and Public Relations</i>	
<i>Visitor Services</i>	
<b>Operations</b> .....	30
<b>1977 Publications of the Scientific Staff</b> .....	31
<b>Report of the Treasurer</b> .....	32
<b>Audited Financial Statements</b> .....	33
<b>Board of Trustees and Trustee Committees</b> .....	38
<b>Staff</b> .....	39
<b>Contributors and Benefactors</b> .....	40
<b>Bequest Form</b> .....	41



*Among the many animals in Wild Asia, the Bronx Zoo's newest and largest exhibits area, are barasingha deer, an endangered species.*



---

## REPORT OF THE PRESIDENT

---

By far the most significant event of 1977 for the New York Zoological Society took place on August 19, when Wild Asia, the largest and most spectacular outdoor exhibition ever created at the Bronx Zoo, opened to the public after three years of construction and nearly a decade of planning. Home for more than 200 Asian mammals and birds, Wild Asia is a new concept in wildlife exhibition and expands the public areas of the Zoo by approximately 20 percent. The exhibition is the gift of the Vincent Astor Foundation and provides yet another demonstration of this great private foundation's commitment to the quality of life in New York City. The Board of Trustees is deeply grateful to the Directors of the Foundation and to Society Trustee Mrs. Vincent Astor for her commitment to the concept of Wild Asia and for her love of the project. The Zoo experience has been immeasurably enriched for the visiting public.

There were several changes in the composition of the Board of Trustees during 1977, and, in this connection, it is my sad duty to report the deaths of two Trustees, Joseph A. Thomas and George F. Baker, Jr. Joseph A. Thomas served loyally and generously on the Board for twenty years. Mr. Thomas took a special interest in the Society's work in the Caribbean, especially in the birds of Trinidad and Jamaica. George F. Baker, Jr., Vice President of the Society, served on the Board for thirty years. As Chairman of the Aquarium Committee and the Animal Kingdom Fund, Mr. Baker played a major role in the expansion of the Aquarium's facilities and in raising funds to increase the Society's capital reserves. Their energetic and creative contributions to the Society's work will be missed.

Two of the Society's closest friends, Mrs. Joseph Thomas and Mrs. Harmon Rimmel, were added to the Board of Advisors during the year. Mrs. Rimmel also assumed the chairmanship of the Women's Com-

mittee. The Trustees nominated George F. Baker III for Board membership in June, and John Elliott, Jr., in December. In 1978 Mr. Elliott will succeed August Heckscher, who served the City as Administrator of Parks, Recreation, and Cultural Affairs and then extended his connection with the Society by serving a term as a Trustee.

The Zoological Society's two volunteer organizations, the Friends of the Zoo and the Women's Committee, were especially active in 1977. The Women's Committee, under Chairman Anne H. Stevenson, generated \$236,000 by organizing a successful benefit party at the Zoo, at which 1,000 dinner guests previewed Wild Asia, and by operating a merchandise mail-order program. The Friends' docent program served children and adult visitors to the Zoo and also reached out to the hospitalized and the house-bound with peripatetic teachers and a collection of traveling animals.

For the third consecutive year, it has been possible for the Society to avoid deficit spending. Increased revenue from admissions and other sources of earned income, as well as increased State, Federal, and pri-

vate contributions, have made this possible. The Trustees' major effort to raise a survival fund, known as the Animal Kingdom Fund, resulted in a cumulative total, by year end, of \$4,560,000 in contributions and pledges since the inception of the campaign just over a year earlier.

All fund-raising programs, including the Animal Kingdom Fund, will be reported on later in the annual report, but on behalf of the Trustees, I would like to acknowledge, in particular, 1977 gifts from the Vincent Astor Foundation, Mr. and Mrs. James Walter Carter, the Exxon Corporation, the Griffiths Foundation, the Charles Hayden Foundation, the William Randolph Hearst Foundation, the Cordelia Scaife May Charitable Trust, the Andrew W. Mellon Foundation, the Charles E. Merrill Trust, the Edward John Noble Foundation, the G. Unger Vetlesen Foundation, Mrs. Lila Acheson Wallace, and the Whitehall Foundation.

**Howard Phipps, Jr.**  
*President*

---

## 1977: VITAL STATISTICS

### At the Bronx Zoo —

- 1,631,464 visitors were recorded, including 300,000 schoolchildren in organized groups. Admission is free on Tuesday, Wednesday, and Thursday. Friday through Monday, adults pay \$1.50, and children \$.75. School groups are free.
- The new Wild Asia exhibition opened to the public on August 19. Until closing for the winter, Wild Asia was seen by over 125,000 riders of the Bengali Express monorail.
- The total number of animals living at the Zoo rose to 3,400.

---

### At the New York Aquarium and Osborn Laboratories of Marine Sciences —

- 407,262 visitors were recorded, including 100,000 schoolchildren in organized groups. Admission is \$2.00 for adults and \$.75 for children. School groups are free.
- The animal collection grew to 13,976 examples of 272 aquatic species and subspecies.

---

### Nationally and Internationally —

- Field researchers funded by the New York Zoological Society worked in 18 places abroad in 1977, pursuing basic research in ecology, animal behavior, and land-use.
- The number of Society-engendered national parks and wildlife reserves worldwide grew to 43 with the creation in Hawaii of the Maui County Whale Reserve in December 1977. This is the world's second aquatic whale preserve established as a result of Society efforts. The first was the Golfo San Jose Marine Reserve off the coast of southern Argentina.
- *Animal Kingdom* magazine increased its circulation to 56,000 by adding the membership rolls of the Jackson (Mississippi), Jacksonville (Florida), San Francisco, and Metropolitan Toronto (Canada) zoos to its distribution.
- In 1977, the Society's programs in New York City and abroad were operated at a cost of \$12,019,000. Operating income amounted to \$11,483,000. New York City's annual contribution toward the Society's operating costs in 1977 amounted to 28 percent of total expenditures.

To a Siberian tiger, winter snow is a welcome addition to its exhibit area in Wild Asia.



---

## REPORT OF THE GENERAL DIRECTOR

The elements of the New York Zoological Society's structure—its great zoo, aquarium, international conservation and field research programs, and laboratories for marine sciences—are clear from each of its reports. However, the elemental nature of its contributions within a larger context is often hidden to the uninitiated.

Wildlife and wild land now survive only at the discretion of man, be it Alaskan tundra or African rain forest. The needs of increased numbers of people are changing attitudes toward land use, including the flora and fauna the land supports. Advances in technological ability have made "reclamation" one kind of developmental expense whose per-unit cost has *decreased*. Schemes to drain immense marshes, to harvest great forests, and to establish whole new re-



gions of pastoral agriculture are going forth in the name of human need with international support of previously unimaginable magnitude.

The changes we are now imposing upon our environment will not subside like ripples in a puddle that will again regain its original aspect. They are alterations that will bring about vast synergistic effects and, for the most part, we do not have sufficient information to adequately anticipate what these effects will be—except continuing changes and response.

### **Environmental Monitoring**

The monitoring of environmental changes and consequent recognition of the nature of the flows of resources and their responses is the early warning system of water and land-use management. However, environmental monitoring is a new science and its techniques, as well as the perception of its implications, are evolving rapidly. Thus, the Society's Osborn Laboratories recently initiated programs to try to determine the transport of heavy metals in marine ecosystems and to understand better the role of plankton



*"Big Mac," an Andean condor, was the first of his species to be bred at the Bronx Zoo.*

in the marine food chain. At the same time, the Labs began an investigation of algal blooms, in order to identify ways of predicting and controlling outbreaks, as well as a long-term study of the pollution of New York's waters and its effects upon marine resources.

Most of the Society's programs for monitoring living resources operate along the interface between man and nature. In 1977, they ranged from an investigation of diminishing primate resources for biomedical research in South America—undertaken for the National Institute of Mental Health by research zoologist Thomas Struhsaker—to a study of range-land resources in Kenya from the standpoint of both wildlife and cattle, with a hard look at competitive and complementary aspects—by resource ecologist David Western (the results were presented at the Rockefeller Foundation-sponsored conference in Belagio, *International Problems In Environmental Monitoring*).

### The Use of Wildlife

The changing relationship of man to the land has brought further exploitation of conspicuous populations of wild creatures. Thus, whales, elephants, and crocodiles have been a focus of Zoological Society study for several years. For whales, the results of the studies of Roger Payne and his colleagues have been material to the understanding of whale populations. His 1977 critiques of unsound harvesting, especially that of the exceptionally rare Alaskan right whale endangered by Eskimos, proved significant to the outcome of the difficult judicial decisions affecting them.

One of the Society's major field programs by grantees is that of Iain Douglas-Hamilton, who has been supported by the NYZS for several years and now is aided by other conservation groups as well. A second year of his continent-wide appraisal of the state of the African elephant identified a few previously unknown populations. But, for the most part, the significance of his work was the drawing of a picture of rapid decline. Concluding, preliminarily, that harvests of elephants for ivory are inevitable, Dr. Douglas-Hamilton and his team are concentrating on ways to rationalize the harvest—to discover how man might best use elephants without losing them.

Meanwhile, at the Osborn Laboratories, intricate studies of the genetics of fishes, supported by colonies bred there for more than sixty generations, produced new information on the mechanisms of sexual maturation and their influence on adult size which will be important to the development of aquaculture programs as a nutritional resource for man. Diseases of fishes are an area of intensive investigation, as a part of an

effort to better determine the basic parameters of productivity in marine food chains. And, in one approach the use of catfish as a bioassay animal to gauge the effectiveness of various drugs in removing iron from the tissues and blood important to certain human diseases is being explored.

Nowhere has the use of wildlife proven more controversial than in the skin and hide trades. NYZS conservation director F. Wayne King is an international authority on the trade and its influence upon the environmental policies and economics of third-world countries. In 1977 his careful analyses exerted a major influence not only upon United States legislation in this area but also upon the development and operation of the Convention on International Trade in Endangered Species of Wild Flora and Fauna. Dr. King's services in this regard emphasize the significance of the advisory role of many NYZS staff members to governmental bureaus, industry, and other non-governmental environmental organizations.

### Basic Science in the Field

The less developed nations are most in need of basic scientific information to make sound decisions in environmental management. Thus, the majority of the Society's field-science programs take place in the least settled parts of the world. During 1977, more than twenty projects were undertaken by the Department of Conservation and the Center for Field Biology and Conservation, and these included scientific investigations in fifteen third-world countries. A high percentage of these projects contribute importantly to the development of national land-use and of park policies which provide the first insights into the probable consequences of change. Thus the Society's long-term study of the African rain forest and of rain-forest primates in Uganda has not only produced new insights into primate behavior and ecology but also helped to provide continued protection for the largest remaining rain forest in all of East Africa.

Changes and response to changes are a proper concern for an organization that has to do with environmental education, actively conducts scientific investigations into living resources, and is concerned with the public development of educated insights into the long-term effects of alternate uses of the environments. Inevitably, the Zoological Society has made significant contributions at the leading edge of today's inexorable currents of change, for international development programs are becoming sensitive to scientific information, where it is available, and even unplanned development and exploitation is beginning to come under various forms of government supervision.

### Habitat Preservation

Informed preservation is an appropriate response to some kinds of change, and it was with great pride that the Society concluded a contract with the Government of Kenya on October 19, that resulted in the gazetting and better protection of Amboseli National Park—the forty-second wildlife reserve resulting from NYZS programs. Explorations between the Maasai Kajiado County Council, the Kenya Ministry of Tourism and Wildlife, and the Society resulted in an agreement that protected the wildlife, enhanced tourism, and provided for continuing compensation based upon tourism revenues for the Maasai.

Yet another sanctuary, this one in the sea, came about when the recommendations of NYZS research zoologist Roger Payne and trustee Nixon Griffis resulted in the Maui County Whale Reserve in Hawaii. Here, the Society's investment was a research presence and a thoughtful proposal based upon Dr. Payne's exceptional history of whale study in the field. The success of the park proposal was typical of the effect Zoological Society scientists have been able to exert in recent years in areas as diverse as Pakistan and Argentina, Nepal and Brazil.

A difficult new study, by Dr. George Schaller, head of the Society's Field Center, is especially noteworthy. Following more than a year of preliminary explorations, Dr. Schaller developed cooperative relationships with biologists in the Brazilian Institute for Forest Development (IBDF) and established a research program in Mato Grosso. He was requested to conduct preliminary surveys of proposed parks and reserves by IBDF, and his work has already led to efforts to establish new refuges. Now concentrating immediate studies upon the jaguar and the animal community of which it is the main predator, Dr. Schaller is endeavoring to provide facts about wildlife that has never been investigated in depth in an area that seems likely to be subjected to great change.

### Propagation of Wild Animals

Adaptability to change is, perhaps, man's most diagnostic character, for no other species can adapt so quickly. Yet, change means extinction for many species—forms some human cultures revere, others detest, some utilize, and more ignore. Actively sustaining declining species, as opposed to simply letting them survive in natural areas through benevolent indifference, is a new and controversial human concern. It results, of course, from the disappearance of natural areas. Without active aid in the form of bird houses, bluebirds would disappear from many areas because of introduced competitors, such as the English sparrow and European starling. American bison survive partly because of early captive breeding

programs and transplantation to protected ranges. Many "game" mammals, birds, and fishes are abundant as a result of supplementary feeding, captive breeding, and introduction or transplantation to new or newly protected areas.

Applied programs for the re-establishment of the peregrine falcon from captive-bred birds in the eastern United States, now followed by a special program for bald eagles in New York State, attest to the public interest in the hard-to-measure esthetic value of these species. On the other hand, new biomedical models for leprosy (armadillos), venereal disease (chimpanzees), and, at the Osborn Laboratories, Cooley's anemia (catfish) suggest that unexpected creatures may sometimes offer new solutions to problems of human welfare. This report is not the place for a review of the values which might accrue from the preservation of species. The effort responds to the need to buy time for the process and techniques of human environmental care to mature: to prevent extinction, sustain diversity, and avoid the permanent loss of options.

The Zoological Society's propagation of rare animals is cooperative—it involves breeding exchange arrangements for animals with seventy other collections—and it is intensive—845 animals were born at the Zoo in 1977. The Wildlife Survival Center on St. Catherine's Island made strides during the year, gaining several new zoo cooperators and producing a substantial number of births. Important propagation efforts are detailed in the reports of the animal departments and the Survival Center. However, it should be noted that three mammal species extinct in nature were reared. Many other animals now very rare also bred; they ranged from king cobras and New York State's endangered bog turtle to the rearing of both the Andean condor and king vulture, distant relatives of the nearly extinct California condor.

The breeding of each zoo and aquarium animal provided us with insights and information which may prove helpful to the survival of its kin. Of course, each contributed to the establishment of populations which can be studied and enjoyed for yet another generation by our visitors. And, each contributed toward the fulfillment of the NYZS educational mission.

### Education

Man's response to environmental change, whether myopic or from long-term perspectives, will depend not only upon the information available to him but also upon the ways it is conveyed.

Abroad, the Society's field programs directly aid students in third-world countries through training by our field scientists and through supervised grants for





independent research. Twenty-six biologists participated in such programs in 1977, and the history of the program appears to assure its participants of places as decision-makers in their homelands. At home, the sixty-fifth student to complete research for an advanced degree at the Osborn Laboratories completed her work on the Bahamian sea cucumber. Adjunct appointments at Uganda's Makerere University, the University of Nairobi, Harvard University, New York University, Fordham University, and Rockefeller University reflect the outreach effect of the Society's scientific staff members.

Both Zoo and Aquarium education departments founded new programs in 1977. Among their most productive new experiments were efforts to provide adult education for fees. The experience suggests that

adult education in environmental problems may become another self-supporting way of raising the environmental literacy of city dwellers. For children, Animal Kingdom Day Camp during the summer was a striking success from the standpoint of both education and recreation, while yet another course, "City in the Forest," broke new ground as a cooperative program between the Zoo and the New York Botanical Garden.

In 1977, *Animal Kingdom*, the Society's distinguished magazine of popular wildlife information, completed the first full year in its challenging attempt to become a national voice and educational tool for American zoos rather than a purely NYZS organ. By December, zoological societies in twelve cities had become subscribers, reflecting great credit on editor Eugene J. Walter, Jr., and his dedicated staff. The

significance of the opportunity to bring up-to-date information on wildlife and environment to such a large and, heretofore, minimally served group of animal enthusiasts has encouraged the Society to undertake a task whose outcome is as problematic as it is exciting.

### Wild Asia

Of course, the primary educational tools of the Zoo and Aquarium are their great collections of living creatures, which increasingly are exhibited in newly provided environments suggestive of their original homes that, in some instances, have disappeared. 1977 saw the opening of the most ambitious outdoor exhibit ever undertaken in an urban zoo: Wild Asia. Built on thirty-eight acres of unused land east of the Bronx River, this huge addition to the Zoo's exhibits program, made possible by the extraordinary generosity of the Vincent Astor Foundation, introduced a new concept in urban zoo land-use.

Visitors are conveyed through Wild Asia's open animal habitats on an especially designed monorail. This "one-sided people-mover" concept permits utilization of a site adjoining a busy highway without distracting viewers with passing cars or views of service facilities. By raising or lowering the monorail track in relation to animal habitats, the need for barrier moats, which are destructive of land and forest, is avoided, and barless viewing is provided.



*Mrs. Vincent Astor, a Trustee of the Society, enjoys an elephant ride at Wild Asia Plaza. Wild Asia was made possible by a generous gift from the Vincent Astor Foundation.*

Instead of enclosing the animal in the zoo-goer's world, the visitor is enclosed in the animal's world and conveyed through it by a driver-guide. The trip is nearly two miles long, and revenue produced by the monorail contributes to the support of the exhibit. The people-mover viewing permits exceptionally large exhibit and animal-care areas, thus providing a new basis for long-term care and breeding of endangered species.

Soon after the new exhibit opened, the Federal government agreed to fund the indoor portion of Wild Asia, which the City had originally agreed to support. By year's end, the new structure, adjacent to the Wild Asia Plaza, was under construction.

The significance of a unique new exhibit like Wild Asia lies in its ability to kindle public interest in wildlife and in its programs for the breeding of rare animals. However, it has an additional significance in the continuance of the New York Zoological Society's tradition of leadership in zoological exhibition; a leadership which has resulted in the adoption of its exhibit ideas and themes in zoos all over the world.

### But not all is well . . .

Despite the significance of the programs outlined above, the Society faced serious problems in 1977. Municipal support continued to decline as a proportion of operating budget, a decline that was only partly offset by generous State aid from the Natural Heritage Trust. Zoo attendance, already damaged by the decline of the Bronx and by the diminution of subway ridership, was further affected by the advent of Sunday shopping, and attendance also fell at the Aquarium. The Society is responding with changes in advertising policy and the development of new plans for making the Zoo more available to visitors. It has also completed an overview of the Zoo's remarkable economic impact on the City. As a result of this statement, Joseph Saltzman of the South Bronx Overall Economic Development Corporation commented, with regard to the future of the Bronx, "The Zoo remains as one of the last bastions of hope, representing not only economic stability but also moral commitment, both to the life within its boundaries and the struggles outside of its walls. It could serve as the focus for a new Bronx."

This report has attempted to place some of the activities of the Zoological Society in context. Its perspectives would be enhanced by comparisons with like institutions. Perhaps it is enough to observe that there is no other American organization with a program of comparable scope.

**William G. Conway**  
General Director



*Among the more than 978 mammals in the Zoo's collection is a magnificent herd of wapiti, or Roosevelt's elk, of North America.*



---

## NEW YORK ZOOLOGICAL PARK

---

### Department of Mammalogy

---

The outstanding events occurring in the Mammal Department centered around the opening of Wild Asia, the largest and most ambitious exhibit ever constructed by the New York Zoological Society. When originally conceived in 1968, the exhibit theme reflected the Society's concern for the rapidly declining wildlife populations in this geographic region. In order to fulfill its obligations toward the preservation of these rare and vanishing animals, seven of the ten species of mammals in the new Asian exhibit are on the endangered species list or are already extinct in nature.

When the ribbon was cut on opening day, 178 mammals, including four Asian elephants, three great Indian one-horned rhinoceros, eight Siberian tigers, five gaur, and scores of deer and antelope, had been relocated to their new and spacious enclosures. Each exhibit was meticulously prepared for its new inhabitants. Miles of fence lines and numerous gates were checked and rechecked for appropriate height and structural soundness. The ground was gleaned for metal, glass, and other objects potentially harmful to the animals, and the tedious and arduous task of removing from each enclosure all of the plentiful black cherry trees and seedlings (the leaves, bark, and twigs

of which are highly toxic to ruminants) was completed. The mammal department also spent weeks and sometimes months acclimating each species to its new home. It is hoped that under careful management, these herds will provide a breeding nucleus for a major propagation center for rare Asian mammals and will insure their long-term survival.

The mammal collection at the Zoo numbered 978 specimens, representing 149 species. During the year, there were 235 births; thus, 73 percent of all mammals added to the collection were born in the park. Rare births included three Mongolian wild horses, seven Pere David deer, and two Wisent—all species extinct in nature—as well as one Grevy zebra, three white-tailed gnu, two barasingha deer, five Eld's deer and three bettongs.

Curatorial research concentrated on designing new and perfecting old management facilities for a number of species within the park. A new exhibit and management area was designed for tundra wolves in order to improve exhibition and care of these animals. And a series of corrals and isolation stalls were completed at the African Plains in order to provide better management for herds of hartebeest and gazelles. A generous gift from Mr. and Mrs. James Walter Carter and the Carter Fund will provide for the renovation of the old antelope house into a new exhibits area for rare large mammals.

**Mammal Collection, Bronx Zoo**  
at December 31, 1977

<i>Order:</i>	<i>Families</i>	<i>Species and subspecies</i>	<i>Specimens</i>
<b>Marsupialia</b> — Kangaroos, phalangers, opossums	2	6	36
<b>Insectivora</b> — Moles, shrews, hedgehogs, etc.	1	1	1
<b>Chiroptera</b> — Bats	3	12	165+
<b>Primates</b> — Apes, monkeys, lemurs, marmosets, etc.	6	26	123
<b>Edentata</b> — Armadillos, sloths, anteaters	3	3	5
<b>Rodentia</b> — Squirrels, mice, porcupines, etc.	13	25	66+
<b>Carnivora</b> — Bears, raccoons, cats, dogs, otters, etc.	6	31	95
<b>Pinnipedia</b> — Seals, sea lions, etc.	2	2	4
<b>Proscidea</b> — Elephants	2	2	8
<b>Perissodactyla</b> — Horses, tapirs, rhinoceroses	3	6	35
<b>Artiodactyla</b> — Cattle, sheep, antelopes, camels, giraffes, deer, swine, hippopotamuses	8	35	440
<i>Totals</i>	49	149	978+

(Only specimens owned by the New York Zoological Society are included)

**Bird Collection, Bronx Zoo**  
at December 31, 1977

<i>Order:</i>	<i>Families</i>	<i>Species and subspecies</i>	<i>Specimens</i>
<b>Struthioniformes</b> — Ostriches	1	1	6
<b>Rheiformes</b> — Rheas	1	1	10
<b>Casuariformes</b> — Cassowaries, emu	2	2	10
<b>Tinamiformes</b> — Tinamous	1	1	13
<b>Sphenisciformes</b> — Penguins	1	4	7
<b>Podicipediformes</b> — Grebes	1	1	1
<b>Pelecaniformes</b> — Pelicans, cormorants, etc.	2	4	20
<b>Ciconiiformes</b> — Herons, ibises, storks, flamingos, etc.	4	19	115
<b>Anseriformes</b> — Swans, ducks, geese, screamers	2	68	548+
<b>Falconiformes</b> — Vultures, hawks, eagles	3	11	28
<b>Galliformes</b> — Quail, pheasants, etc.	3	21	166
<b>Gruiformes</b> — Hemipodes, cranes, trumpeters, etc.	5	19	128
<b>Charadriiformes</b> — Plovers, sandpipers, gulls, etc.	9	29	192+
<b>Columbiformes</b> — Pigeons, doves, sandgrouse	1	6	11
<b>Psittaciformes</b> — Parrots, etc.	1	17	44
<b>Cuculiformes</b> — Touracos, cuckoos	2	9	31
<b>Strigiformes</b> — Owls	2	10	23
<b>Caprimulgiformes</b> — Frogmouths, nighthawks	1	1	18
<b>Trogoniformes</b> — Trogons, quetzels	1	1	1
<b>Coraciiformes</b> — Kingfishers, hornbills, etc.	5	9	43
<b>Piciformes</b> — Barbets, toucans, woodpeckers	3	2	9
<b>Passeriformes</b> — Perching birds	25	71	272
<i>Totals</i>	76	307	1,696+

(Only specimens owned by the New York Zoological Society are included)

## Department of Ornithology

At the end of 1977, the Zoo's bird collection numbered 1,696 specimens of 307 species and subspecies. The number of species and subspecies continues to decline even though the total number of specimens has increased slightly. This trend should continue as our breeding programs are more and more successful, while importation continues to be very difficult because of United States Department of Agriculture restrictions.

Four hundred and sixty-three birds were hatched, while more than 2,200 eggs were recorded in the egg log. Over 67 percent of all birds accessioned in 1977 were hatched in the park.

During 1977, golden breasted glossy starlings and Chilean flamingos produced young for the first time at the Zoo. The three most exciting hatchings were those of the Andean condor, king vulture, and Malayan wreathed hornbill. The hatching and hand-rearing of the Andean condor was the culmination of many years of effort to acquire mates for our egg-laying female condor. After the condor, the king vulture chick seemed a suitable follow-up, as neither species previously had bred successfully here. The highlight of the year came on June 15, when the Malayan wreathed hornbill chick emerged from the nesting tree hollow—the first of his species ever to be bred in captivity.

The breeding group of Malayan banded pittas continued to produce; over twenty chicks hatched during

the year. The hand-rearing of our first second-generation pitta placed this group high on our list for continued propagation.

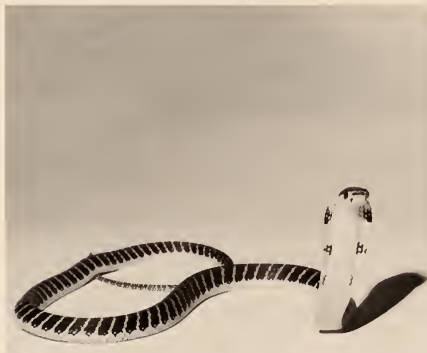
Long-term breeding groups of tufted puffins, scarlet ibis, sun bitterns, Inca terns, Palawan peacock pheasants, Malayan peacock pheasants, West Indian flamingos, white-browed robin chats, golden-breasted buntings, green wood-hoopoes, tawny frogmouths, and Rothschild's mynas also reproduced during 1977.

Curatorial research continued to perfect hand-rearing techniques for a variety of birds. The development of detailed record systems, with information on growth rates and dietary needs and preferences for hand-reared chicks, was a major effort. Hand-rearing the young Andean condor and king vulture provided a wealth of data on these birds. Behavioral studies by students and volunteers contributed to our knowledge of several breeding groups and pairs, such as the hornbills, condors, barbets, and starlings. In addition, the bird department undertook a new artificial insemination program for some of our non-producing endangered species of cranes.

Among the notable acquisitions of the year were ten sarus cranes and eight East African crowned cranes. A major group of North American waterfowl was donated to the collection by Field Associate Ostrom Enders. Dr. S. Dillon Ripley was elected a Field Associate in Ornithology, joining a cadre of talented men who have given generously of their time, council, and personal resources.



*When the first Malayan wreathed hornbill chick ever to be bred in captivity (at left) emerged from the nest cavity, he was almost as large as his attentive father.*



## Department of Herpetology

After many years of unsuccessful attempts to breed what may be the world's rarest crocodilian at the Zoo's Reptile House, the Department of Herpetology initiated in 1976 a cooperative propagation program for Chinese alligators with the Louisiana Wildlife and Fisheries Commission at Rockefeller Refuge. The Zoo's pair and a pair on loan from the National Zoological Park in Washington, D.C., were transferred to spacious, quasi-natural half-acre enclosures that were specially constructed for the program.

In early summer of 1977, the NYZS female nested and deposited a small clutch of eggs. Two hatchlings—representing the first successful captive breeding for this species—occurred in early September. To our great disappointment, both hatchlings were lost within six weeks. However, this limited success provides incentive for the future. While our breeding group is composed of long-term zoo captives, the initial phase of the effort has demonstrated that old, captively reared crocodilians can reproduce if given a satisfactory nesting situation.

The Munich Zoo has graciously contributed its single female Chinese alligator, and the Stuttgart Zoo will send their unpaired female in early 1978. Both will be transferred to Rockefeller Refuge.

Notable among the additions to the Zoo's collection were two diamond pythons, three carpet pythons, two red-phase Hispaniolan boas, two Arizona mountain kingsnakes, three Australian gidgee lizards, a pair of Cunningham's skinks, three stump-tails, a common anaconda, a yellow anaconda, a pair of endangered Florida indigo snakes, one female matamoras turtle, a

## Reptile and Amphibian Collection, Bronx Zoo at December 31, 1977

	Families	Species and subspecies	Specimens
<b>CLASS: Amphibia</b>			
<i>Orders:</i>			
<b>Caudata</b> —Salamanders	4	6	8
<b>Salientia</b> —Frogs, toads	6	13	55
<i>Totals</i>	10	19	63
<b>CLASS: Reptilia</b>			
<i>Orders:</i>			
<b>Chelonla</b> —Turtles	7	32	142
<b>Crocodylia</b> —Alligators, caimans, crocodiles	2	17	74
<b>Squamata</b>			
<i>Suborder:</i>			
<b>Sauria</b> —Lizards	11	27	68
<b>Serpentes</b> —Snakes	4	67	305
<i>Totals</i>	24	143	589

(Only specimens owned by the New York Zoological Society are included)

group of azure poison-arrow frogs, and eight Hispaniolan galliwasp lizards.

1977 produced a bumper crop of reptile youngsters. In all, 150 animals hatched or were born. Included were Pope's pit vipers, shore pit vipers, Asiatic cobras, boa constrictors, reticulated pythons, Cook's tree boas, a streak lizard, rainbow boas, Chihuahua whiptail lizards, gray ratsnakes, pygmy rattlesnakes, and radiated tortoises. In addition, a bog turtle hatchling marked the fifth consecutive year this rare species has been bred at the Bronx Zoo. Most notably, our king cobra breeding program proved successful when six vigorous hatchlings were added to the collection.

Special note must be made of the loss of a rainbow boa that had been in the collection for fourteen years, of a Mexican beaded lizard in residence for ten years, and of a record-sized—thirteen inches long—tiger salamander.

## Department of Animal Health

Since its inception, the Society has been involved in the propagation of rare and endangered animals. During 1977, the Department of Animal Health worked closely with all the animal departments to insure the continued success of the Society's breeding programs.

Preventive medical programs depend heavily on the cooperative efforts of keepers, curators, and the veterinary staff. A particularly high degree of cooperation was evident in the movement of various animals to the new Wild Asia exhibits area. Beginning in June



and ending in August, about 150 mammals and birds were examined, tested for disease, and moved into new quarters. Because these procedures were carried out during the warm months of the year, extreme caution was necessary in immobilizing and moving the large mammals to prevent overheating. The mammal department met this difficult task with great efficiency.

In ornithology, a diagnostic test for aspergillosis, begun in 1976, was finally perfected. The test allows for a one-day diagnosis of this infectious disease in birds and, coupled with the use of amphoterracin B, will make the successful treatment of infected birds possible.

The herpetology department worked with Dr. Raymond Napolitano to complete the initial phase of his study of amoebiasis in reptiles. This serious disease can be controlled only with close vigilance of management practices by keepers and by prompt isolation and treatment of infected individuals.

At the Aquarium, drugs were used successfully prior to and following shipment to prevent the formation of stomach ulcers in the bottle-nosed dolphins. This rather serious condition became apparent in

1975, following the shipment of our dolphin group from Florida. New pool colors were also used to prevent reflection of light in the hope that this may lessen the incidence of eye lesions in pinnipeds and cetaceans. Dr. Roy Bellhorn, our consulting ophthalmologist, first reported on this relationship in 1977.

General animal health at the Wildlife Survival Center on St. Catherine's Island improved as a result of regular parasite control, close monitoring of pregnant animals and newborns, and regular veterinary inspections by the consulting veterinarian, Dr. Morton Silberman, who has a wide range of experience and familiarity with the problems of maintaining animals in a southern area.

Dr. Elizabeth Russo began a two-year residency in comparative medicine in September. She had spent the previous three years in a small-animal practice in Connecticut. Dr. Earl Meyerhenry completed the second year of his residency in pathology, a program sponsored by Mrs. Vincent Astor and Mrs. Joseph Thomas. This program has now completed its fifth year and will be complemented by a clinical program at the Animal Medical Center in New York City during 1978.



*A romp in the snow is enjoyed by one of the Zoo's polar bears.*

## Department of Exhibition and Graphic Arts

For this department, 1977 was the year of Wild Asia. Although this new exhibits area is thirty-eight acres of natural habitat, both sections of the department played a large role in the preparation of this exciting addition to the Zoo scene.

Dominating the entrance to Wild Asia Plaza is a huge figure—the replica of an ancient war lord from Ankhor Wat in Cambodia. This figure, a bust with a cement based, was modeled in fiber glass and cement. Over twenty-feet high, it was painted to simulate weathered stone. Also in the Plaza is a pool decorated with castings of animal sculptures—four large cat heads and a frieze of monkeys—taken from buildings elsewhere in the Zoo. The design and castings were done by the exhibition department.

Wild Asia is identified throughout the Zoo by a totem of an Asian sea serpent. Modeled in a bas-relief plaque, with appropriate color incorporated into the finish, each totem was made of fiber glass and framed in a wooden support. The Wild Asia totem was added to the series that identify the different geographical areas throughout the Zoo.

In addition to Wild Asia, the exhibition department was involved in the refurbishing and repair of other exhibits. The peccary exhibit in South America was redone, and new nesting tree cavities were made for the hornbills in the World of Birds. New master latex molds were also made of rock forms to be used for future exhibits. Some experimental work was conducted with new fibrous cement rock forms. This material is more economical to produce and has a more natural appearance than fiber glass.

The graphic arts section of the department also was busy working on Wild Asia Plaza. Approximately sixteen panels, depicting Asian themes, were silk-screened in a variety of colors. In addition, three large entrance graphics were prepared. Large banners announcing the new exhibit were made for the Zoo's entrance gates. A series of posters was placed in the entrance gate cases to inform the public on the various functions of the New York Zoological Society. These posters were silk-screened onto aluminum to withstand the weather.

Graphics prepared for the Aquarium included backlighted panels for the beluga whale tank and a replacement graphic for the Touch-It Tank.

Printed materials designed by the department—and in many cases, printed in-house as well—included a brochure on Wild Asia and educational pamphlets for the Zoo and Aquarium, as well as the usual labels, flyers, and maps.



*Welcoming visitors to Wild Asia Plaza is the replica of an ancient Cambodian war lord. Over twenty feet high, it was fabricated of fiber glass and cement by the Society's exhibition department.*



## WILDLIFE SURVIVAL CENTER

Through the continued generous cooperation and support of the Edward John Noble Foundation, the Society's breeding program on St. Catherine's Island expanded from five to eleven species during 1977. While the existing addax, sable, and gemsbok herds continued to grow, additional herbivore propagation was initiated with the introduction of dama gazelle, sitatunga, and red kangaroo to the program. With the completion of the first aviary complex, pairs of rare psittacines—red-fronted macaws, palm cockatoos, and Leadbeater's cockatoos—were moved to the Island. They share the aviary with fourteen Hawaiian geese.

A propagation program for species of vanishing cranes was begun with the acquisition of paradise cranes, Indian sarus cranes, and African crowned cranes. A low area was dug out and flooded to provide them with a natural feeding and nesting area. In addition, an animal kitchen/nursery was constructed. Several new enclosures are proposed for 1978, among them a wetland area for sitatunga and a grazing paddock for the Hawaiian geese.

The most notable births of 1977 were two female sable antelope and a second-generation gemsbok born on the Island. Kangaroos, addax, and sitatunga also produced healthy offspring.

The Survival Center continued its working relationship with the American Museum of Natural History, which is involved in several research projects on St. Catherine's. Assistance given to many researchers ranged from treating injured animals to providing information on study sites and bird sightings.

As the facility grows, public interest in the project increases. Among the groups visiting the Island were County commissioners, local high school students, Fish and Game officials, Sierra Club members, and the staff of Oakland Island Education Center.

The Survival Center also is involved in the protection of the local fauna of St. Catherine's Island. Close monitoring of the wildlife populations was carried out during the year, with special emphasis on bald eagles, osprey, alligators, and sea turtles.

## Wildlife Survival Center Collection at December 31, 1977

	<i>Families</i>	<i>Species and subspecies</i>	<i>Specimens</i>
<b>CLASS: Aves</b>			
<i>Orders:</i>			
Anseriformes—Geese	1	1	14
Gruiformes—Cranes	1	3	6
Psittaciformes—Parrots	2	3	12
<i>Totals</i>	4	7	32
<b>CLASS: Mammalia</b>			
<i>Orders:</i>			
Marsupialia—Kangaroos	1	1	6
Artiodactyla—Antelopes	2	6	49
<i>Totals</i>	3	7	55

(Only specimens owned by the New York Zoological Society are included)





## NEW YORK AQUARIUM

The attendance at the New York Aquarium declined markedly (more than 33 percent) over the previous year. An especially cold winter, a blackout, and several rainy weekends during the summer contributed to this decline. Sunday has always been the busiest day at the Aquarium. But Sunday attendance throughout the year was considerably lower than 1976. This was due, at least in part, to the novelty of Sunday shopping.

Trustee Nixon Griffis and Director George D. Ruggeri spent five weeks in the early part of the year touring aquariums in Hawaii, Japan, Okinawa, Noumea, Hong Kong, Australia, and Israel. The high point of the trip was a one-hour chat with Crown Prince Akihito at the Imperial Palace in Tokyo. The Crown Prince has written extensively on goby fishes and Emperor Hirohito has published a definitive and beautiful book on the crabs of Sagami Bay.

The world's largest living crab abounds in the Sea of Japan. This giant of all arthropods reaches a leg span of twelve feet when fully mature. Several of the smaller specimens were shipped from Japan for exhibition at the New York Aquarium.

Other deep-sea specimens, including prawns, anemones, sea cucumbers, barnacles, and chain dogfish,

were collected from the research vessel, *Oregon II*, for exhibition at the Aquarium.

Mr. Griffis, Dr. Kenneth Gold, Assistant Director of the Osborn Laboratories of Marine Sciences, and John Behler, Curator of Herpetology at the Bronx Zoo, made an extensive collection of freshwater fishes in Surinam, South America. Two hundred and fifty specimens, comprising twenty-five different species, were collected. Included in the group were talking catfish, armored catfish, piranhas, twig catfish, and humpbacked head-standers.

Two exhibition tanks were redesigned to house a variety of invertebrates. Sponges, naked snails, sea stars, sea urchins, hermit crabs, and scallops were exhibited in a community setting. And some of our larger animals increased their numbers; harbor seals and gray seals produced young, and five penguin chicks were raised to maturity.

A new feed room was completed and is sufficiently large to attend to the various diets for our mammals, fishes, and invertebrates. In addition, with the help of the Cordelia Scaife May Charitable Trust, a new shark tank will be built that will allow the visitor a multi-dimensional look at these fascinating creatures. Three uniquely designed viewing panels will present sharks as though the visitors were below them, above them, and meeting them head on.



**Aquarium Collection**  
at December 31, 1977

	<i>Species and Subspecies</i>	<i>Specimens</i>
<b>PHYLUM: Chordata</b>		
<b>CLASS: Chondrichthyes</b> (Sharks, rays, and chimeras)		
<i>Orders:</i>		
Heterodontiformes (Horn shark)	1	1
Squaliformes — Typical sharks	4	11
Rajiformes — Rays	0	0
<b>CLASS: Osteichthyes</b> (Bony fishes)		
<i>Orders:</i>		
Semionotiformes — Gars	0	0
Elopiformes — Tarpon, bonefish	1	3
Anguilliformes — Eels, morays	6	9
Salmoniformes — Trouts	1	1
Myctophiformes — Lizardfish	1	1
Mormyridiformes — Scaly mormyrid	1	1
Cypriniformes — Minnows, carp, cavefishes	12	52
Siluriformes — Freshwater catfishes	14	84
Cyprinodontiformes — Platy, swordtails	4	46
Batrachoidiformes — Toadfishes	1	5
Gadiformes — Codfishes	1	2
Atheriniformes — Killifish, silversides	3	90
Beryciformes — Squirrelfishes	4	18
Gasterosteiformes — Seahorses, pipefish	2	8
Perciformes — Perches, sea basses	114	705
Pleuronectiformes — Flatfishes	3	5
Tetraodontiformes — Puffers, boxfish, triggerfish	3	6
Dipnoi — Lungfish	2	4
<b>CLASS: Reptilia</b>		
<i>Order:</i>		
Chelonia — Turtles	7	30
<b>CLASS: Aves</b>		
<i>Orders:</i>		
Sphenisciformes — Penguins	2	19
Anseriformes — Ducks	2	7
<b>CLASS: Mammalia</b>		
<i>Orders:</i>		
Pinnipedia — Seals, sea lions	4	12
Cetacea — Whales, dolphins	2	7
<b>PHYLUM: Coelenterata</b>		
CLASS: Anthozoa (Corals and anemones)	23	10,527
<b>PHYLUM: Annelida</b>		
CLASS: Polychaeta (Marine worms)	2	11
<b>PHYLUM: Arthropoda</b>		
CLASS: Crustacea (Lobsters, shrimps, crabs, etc.)	18	572
CLASS: Arachnida (Horseshoe crab)	2	27
<b>PHYLUM: Mollusca</b>		
CLASS: Amphineura (Chitons)	1	9
CLASS: Gastropoda (Snails)	8	1,020
CLASS: Pelecypoda (Bi-valves)	3	503
CLASS: Cephalopoda (Octopus, nautilus)	2	2
<b>PHYLUM: Echinodermata</b>		
CLASS: Asteroidea (Starfish)	7	136
CLASS: Holothuroidea (Sea cucumbers)	3	14
CLASS: Echinoidea (Sea urchins)	8	28
<i>Totals</i>	272	13,976

## OSBORN LABORATORIES OF MARINE SCIENCES

The administration of the Osborn Laboratories of Marine Sciences confronted the mounting economic pressures of 1977 and reluctantly dismissed three scientists. This sizeable reduction amounted to almost one-third of the professional staff. Reassessment of programs and reordering of priorities by the administration was followed by immediate concerted efforts to develop and fund new projects. By year's end, three new post-doctoral positions in aquaculture had been established through the generosity of the Jessie Smith Noyes Foundation, a search was underway to fill a new staff position in microbial ecology funded by the G. Unger Vetlesen Foundation, two environmental programs had been initiated, and the instrumentation capabilities of the Laboratories were expanded with the addition of a scanning electron microscope funded by the Whitehall Foundation. Funds were also received from the Foundation for the Needs of Others and from Cooley's Anemia Blood and Research Foundation for Children. The latter gift supported a research program into the bullhead catfish's special ability to absorb large doses of iron that are fatal to humans who suffer from Cooley's anemia. Thus, the Osborn Laboratories of Marine Sciences ended 1977 with renewed strength, derived from diversification of programs, newly defined goals, and a staff of highly motivated people committed to basic research in the aquatic sciences.

New projects were begun and others were successfully concluded. Dr. Klaus D. Kallman completed the genetic analysis of sexual maturity in the platyfish *Xiphophorus maculatus*. He found that a "maturation" gene located on the sex chromosome determines when the fish becomes sexually mature. This gene can exist in at least five different states, or alleles. Depending upon which combination of alleles are present, platyfish may become sexually mature as early as eight weeks or as late as seventy-three weeks of age. What is highly significant for aquaculture is the fact that once the fish becomes sexually mature its rate of growth decreases sharply. Therefore, early-maturing fish are considerably smaller than late-maturing fish.

A similar mechanism has been discovered in the pygmy swordtail, *Xiphophorus pygmaeus*. In this species, a gene on the sex chromosome determines the size at which the fish becomes sexually mature. Regardless of environmental conditions, pygmy swordtails having the same genetic complement always mature at the same size. Fish that mature at a larger size bear very little resemblance to the small variant, because different body parts grow at different rates. Such a finding is extremely relevant to evolutionary mechanisms. It shows how a rather simple

genetic change—the substitution of one allele for another—can result in major modifications in body form not unlike those uncovered in the origin of new species. Our genetically defined fish are also being used to assess the effects of certain carcinogens (cancer-producing substances) that have made their way into rivers, streams, lakes, and oceans.

Other environmental programs at the Laboratories are concerned with the effects of organic mixtures of materials (sludge) on fish and one-celled plants (phyto-plankton). A new program was initiated in 1977 to develop base-line information on the dominant species of phytoplankton and zooplankton resident in selected areas of the New York Bight.

The installation of a scanning electron microscope (SEM) and x-ray analyzing equipment has enabled Dr. Kenneth Gold to accelerate studies dealing with the accumulation and determination of mineral composition of particulate matter in marine protozoan shells. SEM investigations were carried out to ascertain the length of time it takes protozoa to build their shells and under what experimental conditions the incorporation process can be modified. Besides providing the information necessary to evaluate protozoa as a source of entry of heavy metals from the water into the food chain leading to humans, basic information on secretory processes, adhesion, and shell development in protozoa also were obtained.

Protozoan infections are among the most important



Research by Dr. Klaus D. Kallman has shown that a gene on the sex chromosome determines the size at which pygmy swordtails become sexually mature; both males shown here hatched at the same time.



diseases encountered in fish on exhibit at the New York Aquarium. Animals may succumb to the infections; tanks have to be treated chemically and sometimes must be completely drained. Thus the parasites create a nuisance and increase the cost of maintaining the fish collection. Outbreaks of two protozoan diseases (odiniiasis and cryptocaryoniasis) can now be controlled by simply varying the temperature and salinity of the water, a technique developed experimentally by Dr. Paul J. Cheung.

Natural-products chemistry research dealt with the toxic material in extracts of a Caribbean sponge. A complex procedure had to be worked out to isolate the substance. New methods to separate active from inactive components using chromatography were tested to complete the isolation of this unusual toxin. Samples of the partially purified material have been provided by bio-organic chemist Dr. Martin F. Stempien, Jr., to a staff member of the Downstate Medical School, S.U.N.Y., in a collaborative effort to gain information on the mode of action of the toxin. If the material proves to be a neurotoxin, as preliminary tests on the common killifish (*Fundulus heteroclitus*) indicate, it may prove useful as a new chemical tool for neurophysiologists.

Students from local universities have traditionally studied with staff members at the Laboratories. Many have completed their degree work before moving on to other academic and/or research communities with their newly acquired skills. The results of the staff-guided research efforts of five individuals ranging from under-graduate to post-doctoral levels, summer as well as year-round, were summarized at a highly successful Annual Summer Students Report, a one-half day seminar program which, it is anticipated, will be repeated yearly.

It is also extremely gratifying to foster the educational development of our supportive staff. Three of the full-time Osborn Laboratories' technical staff were enrolled in Masters of Science (M.S.) degree programs at New York University, while a fourth pursued his doctorate. Each individual has willingly taken on the added responsibility and work load that comes from growing in one's own chosen scientific discipline.

---

## INTERNATIONAL FIELD SCIENCE AND CONSERVATION

---

The year was one of growth and expansion for the conservation program of the New York Zoological Society. Already distinguished by its many endeavors in Africa and Asia, the Society continues to extend its international program; one-third of the studies supported in 1977 were conducted in Latin America. Under the aegis of the Society, Bernard Peyton began a study of the spectacled bear in Peru.

During the year, a total of fifty-four research projects were submitted to the Society for review. Of these, twenty-three were funded through restricted conservation funds, the generosity of private donors and foundations, and government contract. In keeping with the truly international scope of the NYZS Conservation Program, these projects span a total of nineteen nations.

---

### Center for Field Biology and Conservation

---

In 1977, Dr. George Schaller left for Brazil to begin a two-to-three-year study of jaguars, the endangered marsh deer (prey species of the jaguar), and other wildlife in the swampy regions of western Mato Grosso. Dr. Schaller's research base consists of a variety of habitats. Dr. Schaller has been conducting an inventory to determine what mammal species are present, as well as their abundance. Upon completion of his Ph.D. thesis, Andrew Laurie, Research Associate of the Society, will join Dr. Schaller. In addition, two Brazilian collaborators are involved with the project.

In November, Dr. Schaller took some time off from his jaguar study to join several members of the Brazilian Institute for Forest Development (IBDF) and National Institute for Amazon Research (INPA) in a survey of western Amazonas Province to evaluate several areas for possible inclusion into Brazil's reserve system. Only one of Brazil's eighteen national parks and biological reserves, Amazonas National Park presently lies in the rainforest region of the Amazon basin. As a result of this survey sponsored by IBDF, Dr. Schaller has proposed three new reserves.

While George Schaller helped to extend the Society's sphere of influence to Latin America, the other researchers of the Center for Field Biology and Conservation continued their studies in other parts of the world. Dr. Thomas Struhsaker was at work on his long-term study of primates in the Kibale Forest, Uganda. His research is providing basic information on the behavior and ecology of five monkey species, particularly the red colobus. He has been concentrat-

ing on species-niche differentiation through feeding behavior (types of food eaten, ranging patterns, etc.) and on phylogeny. He has also been studying the monkeys' vocalizations. During this, his seventh year of the study, Dr. Struhsaker spent much time in data analysis and writing. In February, he conducted brief surveys of two rare and endangered subspecies of red colobus in central Tanzania.

One of Dr. Struhsaker's students has completed his field work and is currently writing his Ph.D. thesis on the socio-ecology of mangabey monkeys at the Ngogo study area in Kibale. Other students continue their studies of chimpanzees and tree phenology.

Continuing his work on the behavior and conservation of whales, Dr. Roger Payne went to Hawaii to study annual changes in humpback whale songs and to try to correlate recordings with observed behavior in this species. While there, he participated in a documentary dealing with humpback whale songs, behavior, and population dynamics. The program was aired on network television in December.

During his stay in Hawaii, Dr. Payne advised the Mayor's Maui County Whale Reserve Committee on the establishment of a whale park in the surrounding waters of the Maui County islands. The park was first suggested by him and by NYZS trustee Nixon Griffiths after a 1976 visit to the Islands. In December 1977, a mayoral proclamation designated the waters of Maui as a whale reserve during the months of December





through May.

Dr. Payne and his collaborators completed several papers on callosity patterns in right whales as a means of individual recognition; tailing behavior of right whales; and new techniques for remote measuring of whale size, thus reducing interference and traumatic disturbances. The second record album of whale sounds, "Deep Voices," was released during 1977. Dr. Payne's work was funded by several individuals and private foundations, including the Eppley Foundation for Research.

---

## Department of Conservation

---

Although it was a year of growth and expansion for the Conservation Program, one of the most satisfying accomplishments was the completion of a long-term project. The Amboseli National Park Project, initiated by Royal Little and Fairfield Osborn in 1967 was finally completed this year. General Director Conway personally visited Kenya to close the Society's contract with the Government of Kenya to upgrade the former Amboseli Maasai Game Reserve to the full status of Amboseli National Park. To accomplish this, the Society funded a project which has supplied cattle watering facilities outside the Park. In addition a water diversion project created a swamp area in the Sinet Delta, also outside Amboseli, to provide cattle with the necessary grazing protein source during dry seasons. Thus there should be an end to the destruc-

tion caused by the Maasai driving their cattle herds into the Park for watering. Furthermore, the Kenya Government will provide compensation to the ranchers for wildlife that ventures out of Amboseli and onto ranch land—the first time the Government has attempted such a compensatory system.

Dr. David Western joined the Society's ranks as Resource Ecologist. For the past several years, Dr. Western directed the Society's Amboseli Project in Kenya. At the request of the Kenya Government, Canadian International Development Agency, and World Bank, he will now assist the Kenya Ministry of Tourism and Wildlife in establishing and staffing a Wildlife Planning Unit (WPU). The WPU will draw up detailed long-term plans for the development and management of wildlife resources within the whole of Kenya.

Further evidence of the Society's increased involvement in Latin America was reflected by the addition of Dr. Russell Mittermeier to the NYZS staff as a World Wildlife Fund Fellow in Primate Ecology, through the generosity of the Fund. Dr. Mittermeier's main interest is in South American primates; he has recently completed his Ph.D. thesis on the synecology, distribution, and conservation of Surinam monkeys. He is chairman of the IUCN/SSC Primate Specialist Group.

Cristina Palacio joined the department as Staff Conservationist, a position funded by the Muskiwinni Foundation. Among the other private foundations and individuals supporting the Society's conservation pro-



*Amboseli National Park is the forty-second wildlife reserve established as a result of NYZS programs.*

grams was the South Branch Foundation, whose grant will fund the work of several researchers in the field.

As the Society grows and extends, it still continues all of its past activities. Maintaining the Society's role in conservation education, at the university level, public level and government level, Dr. Donald Bruning taught a course entitled "Conservation of Wildlife and their Habitats" at Fordham University. The Society's animal curators all participated in instructing Fish & Wildlife Service agents in methods of identifying endangered species and their products—the first time a full course was taught in the subject.

The Society's staff continues to play an important advisory role both nationally and internationally, to conservationists and government representatives alike. For example, General Director Conway was appointed by the American Ornithologists Union and the National Audubon Society to a committee to advise on the future of the California condor. He attended a symposium on management of endangered bird species, which was convened by NYZS Conservation Fellow Dr. Stanley Temple. He continues to serve on the executive boards of the International Union for the Conservation of Nature and Natural Resources (IUCN), the U.S. Appeal of World Wildlife Fund, and the U.S. Section of the International Council for Bird Preservation (ICBP).

Dr. F. Wayne King met with government officials and

non-governmental conservationists in Kenya and Tanzania to discuss environmental problems and to review the status of NYZS wildlife and parks projects in the area. In the Dominican Republic he met with government officials to discuss the development of a conservation program in that nation. He attended the Special Working Session of the Parties to the Convention of International Trade in Endangered Species of Wild Flora and Fauna (CITES) as one of only three non-governmental members of the United States delegation. Dr. King continues to serve on many international conservation committees; he is a member of the IUCN Survival Service Commission and its Steering Committee, member of the SSC Reptile/Amphibian Specialist Group and chairman of the Crocodile Specialist Group, vice-chairman of the American Committee on International Conservation, and chairman of the Conservation Committee of the Caribbean Conservation Corporation. He was appointed to various new positions this past year: chairman of the Taxonomy Committee of CITES, member of the Endangered Species Monitoring Program Advisory Panel of the Center for Short-Lived Phenomena; member of the International Program Advisory Committee and Tropical Forest Advisory Committee of the Sierra Club.

---

## Field Projects Around the World

---



	PROJECT	INVESTIGATOR	1977 GRANT
1	Hawaii Bermuda	Roger Payne	Staff
2	Colorado	Jaclyn H. Wolfheim	\$14,450
3	Wisconsin	Elizabeth Anderson	1,600
4	Georgia	Albert Bradford Ishmael Williams	3,153
5	Georgia Louisiana	Myrna Watanabe	1,000*
6	Bermuda	David Wingate	3,000
7	Andros Island	Walter Auffenberg	1,680
8	Mexico	Richard Felger	3,000
9	Costa Rica	Support for Asociacion Contrarricense para la Conservacion de la Naturaleza (ASCONA), the only active Costa Rican non-governmental conservation organization	1,500
10	Colombia	Ecological study of the cotton-top tamarin	Patricia F. Neyman 2,480*
11	Colombia	A field guide to the mammals of la Macarena National Park, the first to be published on wildlife in Colombia	Thomas O. Lemke 5,375
12	Surinam	Completion of a study on the distribution, abundance, and conservation of Surinam primates	Russell A. Mittermeier 1,000
13	Peru	Survey of the yellow-tailed monkey, an endangered species that occurs only in Peru	John Cassidy 2,400
14	Peru	Survey of 126 endangered vertebrate species	Antonio Brack 9,000
15	Brazil	Continuation of a study of jaguar and a survey of endangered large mammals	George Schaller Staff
16	Rwanda	Study of the feeding ecology and habitat needs of the mountain gorilla	Amy Vedder A. William Weber 11,550 (5,775)*
17	Uganda	Continuation of study of primate and rainforest ecology and conservation	Thomas Struhsaker Staff
18	Uganda	Ecological studies of Kibale Forest animals and ecosystem by Ugandan students working with Dr. Thomas Struhsaker	5,000
19	Kenya	Completion of Amboseli National Park water diversion and ecological monitoring project	David Western Staff
20	Pakistan	A public education poster program, conceived by Dr. George Schaller and David Hill (RARE), to promote the conservation of the endangered snow leopard	2,000
21	India	Marsh crocodile rearing program	Arjan Singh 1,000
22	Thailand	Survey of the pileated gibbon	Warren Brockelman 2,000
23	Thailand	Ecological research to assist in the planning and establishment of a permanent ecological research station in Huay Khaeng Sanctuary	Ardith A. Edey 4,124*
24	Malaysia	Study of the population ecology of sea turtles and river turtles nesting on the coast of Trengganu	Edward O. Moll 3,224
25	Indonesia	Continuation of a long-term study of orang-utans	Birute Galdikas-Brindamour 3,750*
26	Philippines	Photographic and biological study of the monkey-eating eagle	Alan R. Degen Robert S. Kennedy Neil L. Rettig Wolfgang A. Salb 1,000
27	New Zealand	Study of the behavioral displays of the blue duck	Jan Eldridge 735*

\*Wyman Wildlife Conservation Fund

*A summer day camp proved to be one of the most popular new programs of the Zoo's education department.*



---

## EDUCATION

---

### New York Zoological Park

---

A variety of teacher/student workshops and multiple- and single-visit programs were offered at the Zoo during 1977, as well as special seminars requested by colleges, school districts, and special education agencies. A wide range of instruction and live animal experiences were offered, varying from sophisticated animal behavior and management topics at the university level to animal-discovery programs at the elementary level. In all, department members conducted programs amounting to more than 20,000 student hours. Funding from the Exxon Corporation enabled the department to add two instructors in environmental education, while a gift from the Helena Rubinstein Foundation will provide for the development of a teacher's packet of information on Wild Asia.

A significant portion of this instructional time was devoted to "City in the Forest," a special program offered jointly by the Zoo and the New York Botanical Garden. Sponsored by a grant from the Vincent Astor Foundation and the National Endowment for the Arts, the course was designed for urban fifth-graders. It provided them with an awareness and insight into the animals and ecology of the Northeast.

A new idea in zoo education was initiated with the Animal Kingdom Day Camp for children, ages 8 to 12. It quickly became one of the department's most successful projects. This zoo camp, consisting of one-week sessions, was attended by students from New Jersey, Connecticut, Westchester County, and New York City.

The Children's Zoo proved once more to be a popular spot for visitors. To many people, animal/child contact is what makes this area so special. Concepts and designs for a new Children's Zoo are being developed. Plans for this new facility have begun with a gift from the Charles Hayden Foundation which provided monies to secure an architect for the project.

---

### New York Aquarium

---

The education department at the Aquarium also was involved in a broad range of activities. Throughout the year, more than 900 teachers attended workshops, which included behind-the-scenes tours, beach walks, and "hands-on" experiences. Some 81,000 students, comprising 2,062 groups, arranged tours at the Aquarium; 57 percent of these were from elementary schools. Formal lecture programs were conducted for 5,000 students, on such topics as what lives underwater, survival in the sea, sharks, endangered animals, and adaptations, to an aquatic environment.

Fifty-seven Aquarium volunteers, or docents, answered visitors' questions, gave gallery talks, assisted with teacher workshops, and staffed the Children's Cove. A new show on whale conservation was developed for the Sea Dome Theater. Family workshops were held for 20 family groups, and numerous lectures dealing with the family as a learning unit and the utilization of the Aquarium as a teaching resource were presented by the department throughout the year. Support for the Aquarium's education programs came from the Foundation for the Needs of Others.

---

### Friends of the Zoo

---

A committee of the Zoological Society, the Friends of the Zoo provide volunteer services at the Bronx Zoo. During 1977, 50 weekend volunteers gave guided educational tours to 387 classes, reaching 11,570 students; 45 weekend volunteers led scheduled tours for 1,054 people. Out-reach programs visited 74 hospitals, senior-citizen homes, and day-care centers. In addition, the Friends provided volunteers for the education department's "City in the Forest" and the zoo camp. Weekend volunteers reached uncounted numbers of the public through mini-talks, an information table, puppet shows, and arts and crafts. A special summer teenage program supplied six weeks of volunteer services, Monday through Friday with 55 teenagers who gave in excess of 5,000 hours.

Fifty-three new volunteers completed the training course in the spring and a class of 42 trainees began the 15-week program in the fall.



## ADMINISTRATIVE SERVICES

### Development and Membership Programs

In its second full fiscal year of operation, the development office worked closely with the Chairman of the Development Committee, John Pierrepont, and the Board of Trustees to pursue goals in five distinct but interrelated areas: annual corporate support, annual giving from individuals, operational and project support from private foundations, grants from Federal agencies, and the Animal Kingdom Fund.

At year-end, corporate giving totaled \$243,000 from 174 donors. Major gifts were received from Engelhard-Hanovia and the Exxon Corporation. In October, the corporate development office was relocated, from the Bronx Zoo to new quarters at 245 Park Avenue. The new office was made available through the generosity of Doubleday and Company and provides a Manhattan base of operation not only for the corporate campaign but also for development campaigns headquartered at the Zoo. The success of the corporate program was due largely to the efforts of a very active Business Committee, composed by year-end of nine Trustees and nineteen additional persons dedicated to the Society's goals. The Committee is led by Trustee John D. Macomber, President of the Celanese Corporation.

Excluding the Animal Kingdom Fund, gifts from individuals totaled \$904,000. This included extraordinary contributions from Mr. and Mrs. James Walter Carter for the renovation of the Antelope House at the Zoo.

In 1977, the private foundations contributed a total of \$1,191,000 for projects as diverse as the construction of a new shark exhibition at the Aquarium, the hiring of disadvantaged teenagers for summer programs at the Zoo, and the analysis of data collected in the field by field biologists doing basic research. For projects and operations, excluding gifts to the Animal Kingdom Fund, grants of \$50,000 or more were received from the L.A.W. Fund, Inc., the Cordelia Scaife May Charitable Trust, the Edward John Noble Foundation, the Marilyn M. Simpson Charitable Income Trust, the G. Unger Vetlesen Foundation, and the Whitehall Foundation, Inc.

Among federal agencies, the Energy Research and Development Administration, the Environmental Protection Agency, the National Institutes of Health, and the National Science Foundation granted the Society a total of \$198,922. In addition, the National Endowment for the Arts and the National Museum Act announced grants totaling \$77,230. These two grants are the Society's first from the National Endowment for the Arts and the National Museum Act.

The Animal Kingdom Fund, created in 1976, grew to

*Members of the New York Zoological Society eagerly helped to groom the Wild Asia exhibits for the animals.*



\$4,560,000 in 1977. Under the leadership of George F. Baker, Jr., Chairman of the Fund until his death in December, \$960,000 was contributed by twenty-nine donors, both individuals and private foundations. Contributions of \$250,000 and more were received from the Vincent Astor Foundation and the L.A.W. Fund, Inc., and 1977 payments of \$100,000 and more against prior pledges were received from the Howard Phipps Family Charitable Foundation and the Estate of Joseph A. Thomas.

A healthy membership program forms the basis for all active development programs, and in 1977, membership enrollment was increased by 10 percent, to 8,800. Of this total, 1,218 members, or 14 percent, are in categories costing \$100 or more. Revenue from membership dues increased in 1977 to \$331,430, up 16 percent from 1976. This growth was accomplished by promotional programs funded with grants from the Achelis Foundation, Bodman Foundation, and Morgan Guaranty Trust Company of New York Charitable Trust. Among the new promotional efforts was the distribution of membership materials at all Zoo and Aquarium entrances to every visiting family. In addition on-site sales booths were established at the Zoo, and a retail program at Macy's Manhattan store sold Society memberships during the month of December. An ambitious program for increasing enrollment has been drafted for execution in 1978.

Membership events included the eighty-first annual meeting, on February 9, at Avery Fisher Hall. Two meetings, one in the afternoon, and another in the evening, attracted 3,165 members and their guests.

Other events included an Evening at the Zoo, Breakfast at the Aquarium, the Garden Party and the annual film-lecture, delivered by Dr. L. David Mech at Alice Tully Hall. A special members' event for 1977 was the clean up of Wild Asia, when 200 eager and energetic volunteers helped to prepare the new animal exhibits for its inhabitants by clearing the area of debris.

---

## Personnel

The emphasis in the Personnel Department continues to be in the areas of job training and community involvement. More and more, funding for these projects is sought from governmental and private sources. Thus, a generous grant from the William Randolph Hearst Foundation enabled the Society to employ sixty-nine disadvantaged youths from the Bronx, providing valuable work experience for them and filling needed positions at the Zoo.

Another successful youth program was funded by the Bronx River Soundview Youth Cooperative, while an internship program, sponsored by the New York City Board of Education, helped to further the career objectives of scholarship high-school seniors. The Society also continued its program with the ageing, placing senior citizens in work positions in various departments at both the Zoo and Aquarium.

Work with community groups such as the Italian-American Alliance and the Tremont Improvement Program provided summer employment for young people from the Zoo's neighboring areas. During 1977, fifty-three full-time employees at the Zoo and Aquarium were funded by the CETA program. Federal funds also provided nineteen employees for a special clean-up crew for Wild Asia.

---

## Department of Publications and Public Relations

1977 was the year of the great leap forward for *Animal Kingdom*. With the August/September 1976 issue, the magazine began to publish regional editions for four zoological societies, including New York. By the end of 1977, that number had grown to twelve, and circulation was over 56,000. The magazine was being received by the members of zoological organizations in Boston, Chicago (Brookfield), Fort Wayne, Houston, Jackson, Jacksonville, Miami, New York, Philadelphia, St. Louis, San Francisco, and Toronto, Canada. Several other societies expressed interest in joining during 1978, so growth will continue.

The impetus for this venture was supplied by the Andrew W. Mellon Foundation, which renewed its grant for a second year.

The publications department plans to foster continued growth, both by the addition of more zoological societies and by a circulation campaign to increase the number of individual subscribers. With increased circulation, advertisers for the publication can be sought.

During the year, the magazine featured special reports on Papua New Guinea and Kenya, as well as a manual on the care and treatment of oiled birds. *Animal Kingdom* itself was the subject of an article in *Folio*, "the magazine for magazine management."

The top news story for the Society in 1977 was, without doubt, Wild Asia. It was well covered by the New York City and suburban press and by the television stations. Both the *New York Times* and the *Daily News* supported Wild Asia with editorials, and NBC-TV featured it on the network "Today Show."

Other stories receiving press coverage during the year were the Children's Zoo, the special ConRail train to the Zoo, the hatching of the Zoo's first Andean condor, the hatching of the first Malayan wreathed hornbill chick in captivity, Zoo camp, and—a perennial press favorite—the pelican roundup. Featured news stories at the Aquarium included the dolphin show, the sea lion show, the chambered nautilus, and the giant crab.

The Society continued its paid advertising program with television and print ads. A television commercial for the Zoo, entitled "The Great Explorer," received several awards within the advertising industry. Public service commercials on the Zoo and Aquarium continued to be shown on local stations.

Photographs and film clips were supplied both for publicity purposes and for sale to outside customers by the photo services section of the department. Outside sales help to provide additional revenue for the Society, as well as serving a publicity function. The possibility of a better catalogue system for the Society's film footage is under study. A new system would permit quicker retrieval, wider circulation, and better usage of the Society's films.

*Zoo visitors observe rhino behavior as they travel through the thirty-eight acres of Wild Asia on the Bengali Express monorail.*



---

## Visitor Services

---

### Food and Souvenirs

Overall, the Zoo experienced a modest increase in food sales and a significant improvement in souvenir sales. Wild Asia dominated planning for 1977. Two new food service stands and one souvenir stand were opened at the Plaza. The souvenir stand displayed merchandise that complemented the Wild Asia theme.

The Pub, adjacent to the Aquatic Birds Building, completed its second year of operation in its present format—roast beef platters with glasses of beer or wine—with a 30 percent increase in revenue. The Zoo-going public apparently enjoys this variation from the normal service-stand menu.

Improvements to enhance visitor enjoyment at the

Aquarium were also realized. The Cafeteria was modernized, new umbrellas were acquired for the outdoor dining area, and a new service stand was erected.

### Admissions and Transportation

The major addition to the department was the inclusion of a two-mile Bengali Express by which Zoo-visitors view Wild Asia. Between August 19 and October 30, over 125,000 visitors used this monorail. This system comprises six trains of nine cars each that carry ninety passengers.

Other transportation systems continued to serve the public—Skyfari, the Zoo's aerial tramway, carried 375,000 visitors during 1977. With the opening of Wild Asia, Safari Tour, the surface tractor-train system, added an additional stop near Wild Asia Plaza and increased its visitor traffic to 139,334 persons.





## OPERATIONS

Before the thirty-eight-acre Wild Asia exhibits area was opened to the public in August, construction of the animal shelter building, the holding areas, and the exhibition ranges was completed, including planting and seeding. The six monorail trains for the Bengali Express were tested over the almost two-mile-long track. Also completed was Wild Asia Plaza, the entrance area for the exhibits, with its ponds, benches, graphics, small theater, elephant-ride enclosure, and souvenir and food service stands—all designed with an Asian theme.

Other areas of the Zoological Park saw improvement during 1977. The Bronx park area was enlarged to hold twice the number of cars of its former capacity. The Buffalo parking lot, near Wild Asia Plaza, was also paved and striped. Two new souvenir stands were erected, at the Bronx and Crotona entrances, and over a mile of perimeter fencing was built and improved. The Society also initiated an insulation and energy conservation program, which resulted in reductions of fuel consumption.

Approval of Federal funding, through the Local Public Works Program, enabled New York City to begin construction of the Wild Asia Orientation Building. This 37,000-square-foot building will exhibit Asian animals, such as the Komodo monitors, proboscis monkeys, langurs, clouded leopards, tapirs, and gavials. Visitors will view the animals from bridges within each living habitat. Completely skylighted, the building will have trees, rocks, plants, and waterfalls as its indoor environment and when completed, in about three years, will add to the excitement of the Wild Asia exhibits area.

The continuing reduction of City support has required the use of Society funds for major repairs to buildings and replacement of vehicles and equipment traditionally funded by the City.

*Designed by the Society's graphics department, a series of educational panels was installed around Wild Asia Plaza.*

## 1977 PUBLICATIONS OF THE SCIENTIFIC STAFF

- Behler, John L.** Rotating the crocs. *Animal Kingdom*, 80(2):11-17.
- A propagation program for Chinese alligators (*Alligator sinensis*) in captivity. *Herpetological Review*, 8(4):124-125.
- Bell, Joseph.** Voices from the swamp. *Animal Kingdom*, 80(1):14-15.
- Bronz Zoo rears "Little Mac" (a South American condor chick). *Cage and Aviary Birds*, 45:1, 4.
- Bruning, Donald F.** Breeding the Malay peacock pheasant at the New York Zoological Park. *Avicultural Magazine* 83(2):61-62.
- Inca terns *Larosterna inca* at the New York Zoological Park (with Mary Lou Clare). *International Zoo Yearbook*, 17:173-176.
- Indian birds at the World of Birds in the New York Zoological Park. *Newsletter for Birdwatchers*, 17(2):1-2.
- Cheung, Paul J.** A new method for obtaining barnacle cement in the liquid state for polymerization studies (with George D. Ruggieri and Ross F. Nigrelli). *Marine Biology*, 43:157-163.
- The effects of temperature and salinity on the developmental cycle of *Cryptocaryon irritans* Brown (with George D. Ruggieri and Ross F. Nigrelli). Abstracts of paper read at the V International Congress of Protozoology:401.
- Chib, Joginder S.** Physiologically active substances from marine sponges: heterocyclic compounds (with Martin F. Stempien, Jr., Jack T. Cecil, George D. Ruggieri, and Ross F. Nigrelli). *Journal of Pharmaceutical Science*, 66:1052.
- Conway, William G.** A 36-year laying record of a wattled crane at the New York Zoological Park (with Allegra Hamer). *Auk* 94(4):786-787.
- Improving oilbird nesting ledges in Trinidad, pages 71-74. *In* *Endangered Birds: Management Techniques for Threatened Species* (ed. by Stanley Temple). University of Wisconsin Press, Madison. 466 pages.
- Breeding endangered birds in captivity: the last resort, pages 225-230. *In* *Endangered Birds: Management Techniques for Threatened Species* (ed. by Stanley Temple). University of Wisconsin Press, Madison. 466 pages.
- Care and breeding of puffins and murres at the New York Zoological Park (with Joseph Bell, Donald F. Bruning, and Emil P. Dolensek). *International Zoo Yearbook*, 17:173-176.
- A policy for the acquisition and disposition of zoo and aquarium animals. *International Zoo Yearbook*, 17:198-200.
- Housing (holding, breeding, and experimental), pages 10-21. *In* *Laboratory Animal Management: Wild Birds*. National Academy of Sciences, Washington, D.C. 116 pages.
- Dolensek, Emil P.** Help: a step-by-step manual for the care and treatment of oiled birds (with Joseph Bell). *Animal Kingdom*, 80(4):AK1-AK39.
- Geotrichum infection in gorillas from hydroponic grass (with Raymond Napolitano and Julie Kazimiroff). *Journal of the American Veterinary Medical Association*, November.
- In vitro evaluation of anti-amoebic agents (with Raymond Napolitano). Abstracts of papers read at V International Congress of Protozoology, 413.
- Gold, Kenneth.** Studies on the tintinnida of Enewetak Atoll (with Eleanor A. Morales). *Journal of Protozoology*, 24:580-587.
- The role of protozoa in cycling minerals in the sea: studies on the structure of the lorica of some agglutinated tintinnida (with Eleanor A. Morales). Abstracts of papers read at V International Congress on Protozoology, 41.
- Kallman, Klaus, D.** The genetic control of the pituitary gonadal axis in the platyfish, *Xiphophorus maculatus* (with Martin P. Schreibman). *Journal of Experimental Zoology*, 200:277-294.
- King, F. Wayne.** Inhabitants of this planet Earth (with the editors). *Endangered Species: Part I (Mammals); Part II (Birds, Reptiles, Fish, Mollusks, and Insects)*. A Harper and Row Media Program, Harper and Row, New York. 35mm color slides and accompanying text.
- Laurie, Andrew.** Behavioral ecology of the sloth bear (with John Seidensticker). *Journal of Zoology*, 182:187-201.
- What I learned stalking Indian rhinos. *International Wildlife* 7(4):6-16.
- Rhinos in Thailand (with J. McNeely). *Oryx*, 13:486-489.
- Mittmer, Russell A.** Neural bones in chelid turtles from Australia and New Guinea (with Anders G. J. Rhodin). *Copeia*, 2:370-372.
- Conservation of the Brazilian lion tamarins (*Leontopithecus rosalia*) (with Ademar F. Coimbra-Filho), pages 59-94. *In* *Primate Conservation* (ed. by H. S. H. Prince Rainier III of Monaco and Geoffrey
- H. Bourne). Academic Press, New York. 658 pages.
- Rediscovery and conservation of the Peruvian yellow-tailed woolly monkey (*Lagothrix flavicauda*) (with Hernando de Macedo-Ruiz, B. Anthony Luscombe, and John Cassidy), pages 95-115. *In* *Primate Conservation* (ed. by H. S. H. Prince Rainier III of Monaco and Geoffrey H. Bourne). Academic Press, New York. 658 pages.
- Primate conservation in Brazilian Amazonia (with Ademar F. Coimbra-Filho), pages 117-166. *In* *Primate Conservation* (ed. by H. S. H. Prince Rainier III of Monaco and Geoffrey H. Bourne). Academic Press, New York. 658 pages.
- Primate ranching: results of an experiment (with Robert C. Bailey, Leslie E. Sponsel, and Katherine E. Wolf). *Oryx*, 13(5):449-453.
- Payne, Roger.** Berwertung der Walpopulation durch Photogrammetrie-Technik. *Bild der Wissenschaft*, 14(12):42-49.
- A note of harassment, appendix XIII, page 1. *In* *Report of a Workshop on Problems Related to Humpback Whales (Megaptera novaeangliae)* (ed. by K. Norris). Marine Mammal Commission Reports.
- Schaller, George.** The sheep that isn't. *Animal Kingdom*, 80(1):4-13.
- Aggressive behavior of domestic yak. *Journal of the Bombay Natural History Society*, 73:385-389.
- A note on a population of *Gazella gazella bennetti*. *Journal of the Bombay Natural History Society*, 73:209-211.
- Mountain monarchs. University of Chicago Press, Chicago, Illinois. 425 pages.
- The wonders of lions (with Kay Schaller). Dodd, Mead and Company, New York. 96 pages.
- Struhsaker, Thomas.** Why save Africa's rain forest? African Wildlife Leadership Foundation News, 11(2):7-12.
- Primates and their habitats in northern Colombia with recommendations for future management and research. *In* *First Inter-American Conference on Conservation and Utilization of American Non-human Primates in Biomedical Research*, Scientific Publication No. 317, Pan-American Health Organization, Washington, D.C.
- Western, David.** The ecology of tourists. *Animal Kingdom*, 80(6):23-30.

## REPORT OF THE TREASURER

Major changes in accounting methods were adopted by the Society's management during 1977 in compliance with a proposed audit guide that will be required for all similar not-for-profit organizations for fiscal year beginning after December 31, 1979. These changes cause the following financial statements to reflect more accurately the actual operation of the organization, although they make comparison with prior years difficult.

As of January 1, 1977, restricted revenue and support is reported in the fiscal year when the Society incurs expenditure against it, not necessarily in the year when such revenue or support is received. In addition, amounts received and expended for plant purposes are recorded as restricted monies among operating funds.

Thus, in the year ended December 31, 1977, the Society's total income for operating purposes, including capital projects, was \$13,899,230. Total operating and capital expenses were \$14,682,614. This resulted in a \$783,284 excess of expenditures over revenues. When capital revenue and expenses are excluded, the Society did not experience a deficit. The capital over-expenditure of \$909,650 was incurred in completing the Wild Asia exhibits area, which opened to the public in August.

Government support totaled \$4,324,237, or 31.1 percent of overall revenues: New York City support amounted to \$3,323,005; State support totaled \$877,424; and Federal support totaled \$123,808. As opposed to this major source, income from endowment and other investments provided only \$623,879, or 4.5 percent of total revenues.

All other revenue, \$8,951,114, or 64.4 percent of total revenues, was generated from the private sector. Food sales, parking, souvenir sales, paid exhibition, and transportation revenues at the Bronx Zoo and New York Aquarium generated \$3,295,459, or 23.7 percent of total revenues. Contributions and bequests totaled \$2,728,959, or 19.6 percent of all income. Admission charges at the Zoo and Aquarium provided \$1,435,151, or 10.3 percent of the total. Membership dues, pension fund revenue, expiration of term endowments, and miscellaneous revenues provided the remaining 10.8 percent of the Society's total income. These figures represent increased income over 1976 in every area but contributions and bequests (because of an extraordinary 1976 gift for Wild Asia), and admissions revenues, which decreased by approximately 2 percent. Revenue generated by visitor spending increased by approximately 7 percent, however, as per capita spending by visitors at the Aquarium rose to \$2.32 and at the Bronx Zoo to \$2.29.

The Society's expenses rose in 1977, partly as a result

of inflation, but more importantly with the major expense of completing Wild Asia and opening it to the public, and with an influx of grant monies to permit expanded service and programs in the areas of research, conservation, education, and membership. In operating the Zoo and Aquarium, and in general management, increases in expenditures were conservative, only 7 percent and 8 percent respectively. Overall expenses break down into the following general categories: Bronx Zoo and Aquarium exhibits (including capital expenditures), 57.3 percent of the total; visitor services and admissions programs, 14.9 percent; research and conservation programs, 9.4 percent; management, 7.8 percent; educational activities, 7.1 percent; and membership and fund-raising, 3.5 percent.

The Animal Kingdom Fund is the Society's campaign to create greater financial stability. The need for the Fund is underscored by the fact that income from invested capital provided only 4.5 percent of the Society's total revenues in 1977. A term endowment, the Animal Kingdom Fund has added \$2,630,205 in cash contributions to the Society's financial reserves at December 31, 1977. An additional \$1,930,000 had been pledged to the Fund but is not recorded in the financial statements, as pledges are recorded upon receipt.

**John Pierrepont  
Treasurer**

PEAT, MARWICK, MITCHELL & CO  
CERTIFIED PUBLIC ACCOUNTANTS  
345 PARK AVENUE  
NEW YORK, NEW YORK 10022

The Board of Trustees  
New York Zoological Society

We have examined the balance sheet of New York Zoological Society as of December 31, 1977, and the related statements of operating support and revenue, expenditures and capital additions and changes in fund balances, of changes in financial position, and of functional expenditures for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As explained in note 1 to the financial statements, expenditures for land, buildings and equipment are not capitalized, and depreciation of buildings and equipment is, therefore, not recorded. Such practices are not in accordance with generally accepted accounting principles.

In our opinion, except for the effect on the financial statements of the matter discussed in the preceding paragraph, the aforementioned financial statements present fairly the financial position of New York Zoological Society at December 31, 1977, and the results of its operations and changes in its financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year except for the changes, with which we concur, in accounting for restricted funds as described in note 2 of notes to financial statements.

March 24, 1978

*Peat, Marwick, Mitchell & Co.*

# New York Zoological Society

## Balance Sheet

December 31, 1977

Assets		Liabilities and Fund Balances	
Operating Funds			
Cash .....	\$ 1,003,501	Accounts payable and accrued expenses .....	\$ 1,225,449
Investments (note 3) .....	7,918,218	Deferred support and revenue — restricted (notes 2 and 8) .....	4,366,458
Accounts receivable .....	460,686	Fund balances:	
Grants receivable (note 4) .....	1,128,849	Designated by Board of Trustees for long-term	
Inventories, at lower of cost or market .....	327,382	investment .....	\$5,282,029
Prepaid expenses and deferred charges .....	366,452	Undesignated .....	331,152
Total .....	\$11,205,088	Total fund balances .....	5,613,181
		Total .....	\$11,205,088
Endowment Funds			
Cash .....	1,077,724	Fund balances:	
Note receivable .....	15,037	Endowment — income unrestricted .....	2,370,102
Investments (note 3) .....	4,659,202	Endowment — income restricted .....	846,143
			3,216,245
Total .....	\$ 5,751,963	Term endowment — income unrestricted (note 6) .....	2,535,718
		Total .....	\$ 5,751,963

See accompanying notes to financial statements.

# New York Zoological Society

## Statement of Operating Support and Revenue, Expenditures and Capital Additions and Changes in Fund Balances

Year ended December 31, 1977

	Operating funds			Endowment funds	
	Unrestricted	Restricted	Total	Animal Kingdom	Other
<b>Operating support and revenue:</b>					
Contributions and bequests .....	\$ 707,970	2,020,989	2,728,959	—	—
Fees and grants from governmental agencies .....	—	4,324,237	4,324,237	—	—
Admission charges .....	—	1,435,151	1,435,151	—	—
Food sales, parking, souvenirs, exhibit and transportation					
revenues (note 5) .....	100,000	3,195,459	3,295,459	—	—
Membership dues .....	315,776	6,580	322,356	—	—
Endowment and other investment income .....	316,766	307,113	623,879	—	—
Pension fund revenue .....	356,730	—	356,730	—	—
Miscellaneous revenue .....	298,409	416,449	714,858	—	—
Expiration of term endowment (note 6) .....	—	97,601	97,601	—	—
Total support and revenue excluding realized gains (losses)					
on investment transactions .....	2,095,651	11,803,579	13,899,230	—	—
<b>Operating expenditures:</b>					
<b>Program services:</b>					
Zoological park and aquarium exhibits .....	25,713	8,391,572	8,417,285	—	—
Conservation and separately budgeted research .....	5,704	1,370,999	1,376,703	—	—
Educational activities .....	889,967	158,317	1,048,284	—	—
Visitor services and admissions .....	—	2,182,384	2,182,384	—	—
Membership activities .....	136,900	75,000	211,900	—	—
Total program services .....	1,058,284	12,178,272	13,236,556	—	—
<b>Supporting services:</b>					
Management and general .....	765,727	379,113	1,144,840	—	—
Fund Raising .....	145,274	155,844	301,118	—	—
Total supporting services .....	911,001	534,957	1,445,958	—	—
Total expenditures .....	1,969,285	12,713,229	14,682,514	—	—
Excess (deficiency) of operating support and revenue over					
expenditures before realized gains (losses) on investment					
transactions .....	126,366	(909,650)	(783,284)	—	—



**New York Zoological Society**  
**Statement of Operating Support and Revenue, Expenditures and Capital**  
**Additions and Changes in Fund Balances (Continued)**

	Operating funds			Endowment funds	
	Unrestricted	Restricted	Total	Animal Kingdom	Other
Realized gains (losses) on investment transactions . . . . .	(332,980)	50	(332,930)	—	—
Excess (deficiency) of operating support and revenue over expenditures before capital additions (carried forward) . . .	(206,614)	(909,600)	(1,116,214)	—	—
Excess (deficiency) of operating support and revenue over expenditures before capital additions (brought forward) . . .	(206,614)	(909,600)	(1,116,214)	—	—
<b>Capital additions:</b>					
Contributions and bequests . . . . .	—	—	—	2,630,205	12,500
Proceeds from the sale of assets other than investments . . . . .	—	—	—	—	210,000
Net realized gains (losses) on investments . . . . .	—	—	—	3,114	(137,877)
Total capital additions . . . . .	—	—	—	2,633,319	84,623
Excess (deficiency) of operating support and revenue over expenditures after capital additions . . . . .	(206,614)	(909,600)	(1,116,214)	2,633,319	84,623
Fund balances at beginning of year, as restated (note 2) . . . . .	6,729,395	—	6,729,395	—	3,131,622
<b>Other changes:</b>					
Transfer to finance overexpenditure of restricted funds (note 5) . . .	(909,600)	909,600	—	—	—
Expiration of term endowment (note 6) . . . . .	—	—	—	(97,601)	—
Fund balances at end of year . . . . .	\$ 5,613,181	—	5,613,181	2,535,718	3,216,245

**New York Zoological Society**  
**Statement of Changes in Financial Position**

Year ended December 31, 1977

	Operating funds	Endowment funds	Total all funds
<b>Resources provided:</b>			
Excess (deficiency) of operating support and revenue over expenditures before capital additions . . . . .	\$ (1,116,214)	—	(1,116,214)
<b>Capital additions:</b>			
Contributions and bequests . . . . .	—	2,642,705	2,642,705
Proceeds from sale of assets other than investments . . . . .	—	210,000	210,000
Net realized losses on investments . . . . .	—	(134,763)	(134,763)
Excess (deficiency) of operating support and revenue over expenditures after capital additions . . . . .	(1,116,214)	2,717,942	1,601,728
Additions which do not use resources —			
net losses realized on investments . . . . .	348,588	134,763	483,351
Decrease in due from other funds . . . . .	1,166,109	—	1,166,109
Decrease in accounts and pledges receivable . . . . .	306,860	—	306,860
Decrease in grants receivable . . . . .	152,386	—	152,386
Decrease in notes receivable . . . . .	—	4,489	4,489
Decrease in inventories . . . . .	4,376	—	4,376
Increase in accounts payable and accrued expenses . . . . .	444,784	—	444,784
Proceeds from the sale of investments . . . . .	8,819,753	2,399,786	11,219,539
Total resources provided . . . . .	10,126,642	5,256,980	15,383,622
<b>Resources used:</b>			
Increase in prepaid expenses and deferred charges . . . . .	114,415	—	114,415
Decrease in due to other funds . . . . .	1,145,886	20,223	1,166,109
Decrease in deferred amounts . . . . .	1,934,152	—	1,934,152
Purchase of investments . . . . .	7,005,986	4,107,160	11,113,146
Total resources used . . . . .	10,200,439	4,127,383	14,327,822
Less other changes — expiration of term endowment . . . . .	—	97,601	97,601
Increase (decrease) in cash . . . . .	\$ (73,797)	1,031,996	958,199



# New York Zoological Society Statement of Functional Expenditures

Year ended December 31, 1977

Type of Expenditure	Program services						Supporting services		
	Zoological Park and Aquarium exhibits	Conservation and separately budgeted research	Educational activities	Visitors' services and admissions	Membership	Total	Management and general	Fund raising	Total program and supporting services
Salaries and wages	\$3,354,072	393,187	322,448	1,062,236	51,550	5,183,493	544,251	81,613	6,250,864
Payroll taxes and employee benefits	1,009,716	117,830	94,338	208,435	13,961	1,444,280	158,917	22,324	1,625,521
Professional fees	39,841	19,233	2,487	15,805	11,980	89,346	107,913	107,306	215,219
Supplies and materials	725,111	135,384	21,869	126,513	5,429	1,014,306	40,393	5,272	1,059,971
Telephone and telegraph	5,735	7,000	—	1,964	—	14,699	92,288	77	92,365
Postage and shipping	1,156	5,297	53	3,816	12,071	22,393	11,762	3,357	37,512
Transportation/mileage	16,444	17,873	6,552	1,007	2,300	44,176	5,482	1,306	50,964
Research and collection expeditions	—	75,925	—	—	—	75,924	—	—	75,924
Conferences, conventions and meetings	1,690	282	1,730	1,303	126	5,131	15,607	—	20,738
General insurance	537	605	6,852	111,291	—	119,285	81,328	204	200,817
Awards and grants	—	398,280	—	—	—	398,280	—	—	398,280
Subscriptions and reference publications	131	6,036	5,314	112	—	11,593	1,935	26	13,554
Public relations and promotion	—	75,924	329,849	1,694	96,109	502,754	7,118	63,705	573,577
Land, buildings, animals and equipment	2,663,544	—	—	—	—	2,663,544	—	—	2,663,544
Cost of goods sold	—	47,547	283	559,054	—	606,884	—	—	606,884
Repairs and maintenance	206,879	19,530	—	36,651	15,991	279,051	73,554	291	352,896
Food and forage	378,094	8,642	1,457	12,109	—	400,302	—	—	400,302
Publications	—	6,327	223,903	—	—	230,230	—	9,713	239,943
Other — miscellaneous	14,335	42,624	31,149	40,394	2,383	130,885	4,292	5,924	141,011
Total	\$8,417,285	1,376,703*	1,048,284	2,182,384	211,900	13,236,556	1,144,840	301,118	14,485,958
									14,682,514

\*Includes \$491,545 related to the operations of the Osborn Laboratories.

See accompanying notes to financial statements.

## Notes to Financial Statements December 31, 1977

### (1) Summary of Significant Accounting Policies

The financial statements of the Society have been prepared on the accrual basis except for depreciation as explained below. The significant accounting policies are as follows:

#### Fund Accounting

In order to ensure observance of limitations and restrictions placed on the use of available resources, the accounts are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds established according to their nature and purposes. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups.

The assets, liabilities and fund balances of the Society are reported in two self-balancing fund groups:

*Operating funds*, which include unrestricted and restricted resources:

- Unrestricted funds represent the portion of operating funds available for the support of Society operations.

- Funds restricted by the donor, grantor, or other outside party for particular operating purposes (including accessions and other capital additions) are deemed to be earned and reported as revenues of the operating fund when the Society has incurred expenditures in compliance with the specific restrictions. Such amounts received but not yet earned are reported as restricted deferred amounts.

*Endowment funds*, which include the following restricted resources:

- Funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and only the income be used.
- Term endowment funds which must be held intact except that at some future date or specified occurrence, some portion or all of the principal may be used (see note 6).

#### Plant Assets and Depreciation

Expenditures of operating funds for plant acquisitions are not capitalized, and accordingly depreciation is not recorded in the

Society's financial statements.

#### Collections

Expenditures for collections are not capitalized.

#### Other Matters

All gains and losses arising from the sale, collection or other disposition of investment and other noncash assets are accounted for in the fund that owned the assets. Ordinary income from investments, receivables, and the like is accounted for in the fund owning the assets, except for income derived from investments of endowment funds, which is accounted for, if unrestricted, as revenue of the unrestricted operating fund or, if restricted, as deferred amounts until the terms of the restriction have been met.

Enforceable pledges for operating purposes, less an allowance for uncollectible amounts, are recorded as receivables in the year made. Pledges for support of current operations are recorded as operating fund support. Pledges for support of future operations are recorded as deferred amounts in the operating fund. Pledges to the Animal Kingdom Fund are recognized upon payment of the pledge.

## (2) Accounting Changes

As of January 1, 1977, the Society changed its accounting policy for recognizing restricted support and revenue. Prior to 1977, funds restricted by donor, grantor or other outside party were reported as support and revenue when received or accruable. Such amounts are now reported as support and revenue when the Society has incurred expenditures in compliance with the specific restrictions. Amounts received but not earned are reported as restricted deferred amounts. The effect of adopting this change was to increase restricted support and revenue by \$481,817 for the year ended December 31, 1977.

In addition, the Society combined the activities and balances of unexpended land, buildings, animals and equipment funds with those of restricted operating funds.

The above changes have been recognized retroactively and the effects on beginning fund balances are as follows:

	Current restricted	Land, buildings, animals and equipment
Fund balances at beginning of year, as previously reported	\$ 1,796,344	2,934,487
Combination of current restricted funds and unexpended land, buildings, animals and equipment funds	2,934,481	(2,934,481)
Restatement of unexpended restricted balances as deferred amounts	(4,730,825)	—
Fund balances at beginning of year, as restated (see note 5)	\$ —	6

The above changes have been adopted because, in the opinion of management, the resulting financial statement presentation more fairly reflects the operations of a zoological park and aquarium.

## (3) Investments

Investments are reflected at cost or fair market value at date of gift. The market value and cost of investments by fund were as follows at December 31, 1977:

	Market value	Carrying value
Operating funds — expendable	\$ 9,202,653	7,918,218
Endowment funds — non-expendable	3,106,475	4,659,202
	<u>\$12,309,128</u>	<u>12,577,420</u>
Investments are composed of the following:		
Short-term investments	\$ 2,712,279	2,817,252
Corporate stocks	6,863,241	6,927,222
Corporate bonds	1,144,719	1,239,197
U.S. Government obligations	1,588,889	1,593,749
	<u>\$12,309,128</u>	<u>12,577,420</u>

The following tabulation summarizes changes in relationships between carrying values and market values of investment assets:

	Market values	Carrying value	Net gains (losses)
End of year	\$12,309,128	12,577,420	(268,292)
Beginning of year	<u>13,555,577</u>	<u>13,167,164</u>	<u>388,413</u>
Unrealized net losses for the year			(656,705)
Realized net losses for the year			(483,351)
Total net losses for the year			<u>\$(1,140,056)</u>

The average annual yield, exclusive of net gains, was 4% and the annual total return was -5% for the year ended December 31, 1977.

The New York State Not-for-Profit Corporation Law, which became effective on September 1, 1970, permits the use of realized gains on investment transactions of endowment funds. Such gains are currently being added to principal but may be utilized at the description of the Board of Trustees.

## (4) Grants Receivable

Grants receivable of the operating funds represent amounts pledged to the Society for certain operations and for the completion of particular projects in future years. The grants are expected to be collected as expenditures for those projects are made by the Society.

## (5) Land, Buildings, Animals, and Equipment

Expenditures for land, buildings, animals and equipment have been charged to operating funds and have not been capitalized. Such expenditures include, but are not limited to, the following:

National collection of heads and horns, art gallery, library and sundry items  
Collection of living animals  
Coney Island real estate  
Equipment of visitor facilities

Prior to 1977, the above assets were recorded at the nominal value of \$6. During the current year, the Society determined that the expended land, buildings, animals and equipment fund was no longer required for presentation in the financial statements. Accordingly, the change in fund balance for this fund for the year ended December 31, 1977 is as follows:

Fund balance at beginning of year	\$ 6
Write-off of nominal values for plant assets and collections	(6)
Fund balance at end of year	<u>\$ —</u>

The Society, in the construction of certain capital projects during 1974 and 1977, expended, in the aggregate, approximately \$1,800,000 in excess of funds restricted for such projects. The overexpenditures in the restricted operating funds have been financed by transfers of unrestricted funds (\$909,600 in 1977). The transfer is being returned to the unrestricted funds from the net income of the Skyride and the Monorail at the rate of \$200,000 per year through 1983 and \$100,000 per year through 1986. As of December 31, 1977, \$300,000 had been returned including \$100,000 in the current year.

#### (6) Term Endowment

During 1976, the Society initiated the Animal Kingdom Fund as a capital funds drive. The Fund was established as a term endowment fund to serve various functions — to provide revenue for animal operations, and to finance programs and improved facilities to produce revenue and increase attendance, as well as to provide the Society with a "survival" fund in the event that its other sources of revenue become insufficient to maintain the Society's programs. As a term endowment, the Fund is subject to the following conditions:

- (a) The income of Animal Kingdom Fund shall be used for the general operating purposes of the Society; and
- (b) the principal of Animal Kingdom Fund may be expended only upon the affirmative vote of two-thirds of the Trustees present at any duly held meeting of the Board of Trustees or its Executive Committee (i) to finance programs or improvements to facilities (i.e., the Bronx Zoo, the New York Aquarium, or other facilities of the Society) to produce revenue or increase attendance, or (ii) to ensure the survival of the Society if funds from other sources fail to provide sufficient revenue to maintain the Society's programs; and, provided, however, that in the case of any contribution to Animal Kingdom Fund which was subject to a restriction not to expend the principal of such contribution without the prior consent of the donor thereof, in addition to the vote of the Trustees described above, such consent must be obtained in writing prior to the expenditure of such principal. During 1977, the Society recognized in operating funds expired term endowments aggregating \$97,601.

Pledges to the Animal Kingdom Fund received prior to January 1, 1977 had been recognized as an asset and as deferred support in the restricted fund pending formal Board approval of the gift instrument. Since the Fund is being recognized as a term endowment, pledges are now recognized only to the extent paid.

Pledges to the Animal Kingdom Fund aggregating approximately \$1,930,000 are due to be collected as follows:

Year	Amount
1978	\$868,000
1979	381,000
1980	290,000
1981	313,000
1982	23,000
1983-7	<u>55,000</u>

#### (7) Pension Plan

All eligible Society employees are members of the Cultural Institutions Retirement System's (CIRS) Pension Plan. Pension expense was approximately \$714,000, of which approximately \$368,000 was financed by an appropriation from the City of New York. The current year's provision includes amortization of prior service cost over a period of 30 years commencing June 30, 1974. The Society's policy is to fund pension cost accrued and no unfunded vested benefits existed as of June 30, 1977, the date of the latest plan valuation.

Certain employees of the Society were formerly participants in the Society's pension fund. Effective January 1, 1975, benefits of the CIRS Plan were substituted for benefits previously accrued under the Society's pension fund. The assets of the pension fund approximated \$1,715,000, including securities with a market value of approximately \$1,797,000 as of December 31, 1977. These assets will be used to fund current pension costs and as yet undetermined past service costs relating to substitution of CIRS benefits for periods prior to January 1, 1975. During 1977, \$357,000 was used for pension payments and is reflected as revenue and expense in operating funds. Based on preliminary estimates, it is the opinion of management that the assets of the pension fund will be sufficient to fund these past services costs.

#### (8) Deferred Restricted Support and Revenue

The changes in deferred support and revenue for the year ended December 31, 1977 are as follows:

Balances at beginning of year, as restated (note 2)	\$ 6,300,610
Additions:	
Contributions and bequests	1,862,051
Fees and grants from governmental agencies	4,194,219
Admission charges and visitor services revenues	4,652,082
Investment income	235,105
Net loss on investment transactions	(15,608)
Other	<u>393,813</u>
	17,622,272
Deductions:	
Contributions to Animal Kingdom Fund transferred to Endowment Fund	\$ 1,452,285
Funds expended during year	<u>11,803,529</u>
	13,255,814
Balances at end of year	<u>\$ 4,366,458</u>

#### (9) Functional Allocation of Expenses

The costs of providing the various programs and other activities of the Society have been summarized on a functional basis in the statement of support and revenue, expenditures and capital additions and changes in fund balances. Accordingly, certain costs have been allocated among the programs and supporting services benefited.

#### (10) Collections

During 1977, accessions of collections aggregated \$148,431 while deaccessions aggregated \$9,308.

#### (11) Other

The Society is the ultimate beneficiary under a trust held by Community Funds, Inc. of New York, N.Y. The income arising from the investments of the principal is paid to the Society for restricted operating purposes.

# Board of Trustees and Trustee Committees at December 31, 1977

## Officers

Laurance S. Rockefeller  
*Honorary Chairman*  
Howard Phipps, Jr.  
*President*  
Charles W. Nichols, Jr.  
*Chairman, Executive Committee*  
Henry Clay Frick II  
*Vice-President*  
Mrs. William Ward Foshay  
*Vice-President*  
John Pierrepont  
*Treasurer*  
Frederick A. Melhado  
*Secretary*  
Harold C. Palmer  
*Assistant Secretary*

## Trustees

Alexander Aldrich  
Mrs. Vincent Astor  
George F. Baker III  
Guy Cary  
Mrs. William Ward Foshay  
Henry Clay Frick II  
Peter R. Gimbel  
Robert G. Goelet  
Nixon Griffis  
Gilbert M. Grosvenor  
August Heckscher  
John N. Irwin II  
Frank Y. Larkin  
Dan W. Lufkin  
John Macomber  
Anthony D. Marshall  
Otto Marx, Jr.  
Peter Matthiessen  
Frederick A. Melhado  
G. W. Merck  
Charles W. Nichols, Jr.  
Augustus G. Paine  
Howard Phipps, Jr.  
John H. Phipps  
John Pierrepont  
Mrs. John L. Procope, Jr.  
Eben W. Pyne  
Laurance S. Rockefeller  
John T. Sargent  
David T. Schiff  
Chauncey Stillman  
Mrs. Judith C. Symonds  
Landon K. Thorne, Jr.  
Mrs. Lila Acheson Wallace  
Robert Winthrop

## Ex Officio Trustees

The Mayor, City of New York  
Commissioner of Cultural Affairs  
President, Borough of the Bronx  
President, Borough of Brooklyn

## Executive Committee

Charles W. Nichols, Jr.  
*Chairman*  
Mrs. Vincent Astor  
Mrs. William W. Foshay  
Henry Clay Frick II  
Nixon Griffis  
John N. Irwin II  
Frank Y. Larkin  
Frederick A. Melhado, *ex officio*  
Howard Phipps, Jr., *ex officio*  
John Pierrepont, *ex officio*  
Laurance S. Rockefeller  
John T. Sargent  
David T. Schiff

## Finance Committee

David T. Schiff, *Chairman*  
George F. Baker III  
Guy F. Cary  
Frederick A. Melhado  
Howard Phipps, Jr., *ex officio*  
John Pierrepont, *ex officio*

## Auditing Committee

John Pierrepont, *Chairman*  
Guy F. Cary  
Howard Phipps, Jr., *ex officio*  
David T. Schiff

## Nominating Committee

Augustus G. Paine, *Chairman*  
Mrs. William W. Foshay  
Henry Clay Frick II  
Frederick A. Melhado  
Howard Phipps, Jr., *ex officio*

## Business Operations Committee

Dan W. Lufkin, *Chairman*  
Frank Y. Larkin  
Howard Phipps, Jr., *ex officio*

## Budget and Salary Committee

David T. Schiff, *Chairman*  
William G. Conway  
Charles W. Nichols, Jr.  
Howard Phipps, Jr., *ex officio*  
John Pierrepont  
George D. Ruggieri

## Conservation Committee

Frank Y. Larkin, *Chairman*  
Mrs. Vincent Astor  
Donald F. Bruning  
James Walter Carter  
William G. Conway  
Allerton Cushman  
James G. Doherty  
Mrs. William Ward Foshay  
Henry Clay Frick II  
Robert G. Goelet  
Gilbert M. Grosvenor  
Mrs. Philip D. Holden  
F. Wayne King  
Lars-Eric Lindblad  
Peter Matthiessen  
John Mayer  
G. W. Merck  
Barclay Morrison  
Charles W. Nichols, Jr.  
Peter S. Paine  
Harold C. Palmer  
Roger S. Payne  
Howard Phipps, Jr.  
John H. Phipps  
Harmon L. Remmel  
Laurance S. Rockefeller  
George D. Ruggieri  
George B. Schaller  
Chauncey D. Stillman  
Thomas T. Struhsaker  
Landon K. Thorne, Jr.

## Development Committee

John Pierrepont, *Chairman*  
Mrs. Vincent Astor, *Vice-Chairman*  
Guy F. Cary  
Mrs. William Ward Foshay  
Nixon Griffis  
John Irwin II  
Frank Y. Larkin  
John Macomber  
Frederick A. Melhado

Howard Phipps, Jr., *ex officio*  
Mrs. John L. Procope, Jr.  
Laurance S. Rockefeller  
Mrs. Judith C. Symonds

## Editorial Committee

John T. Sargent, *Chairman*  
William G. Conway  
Gilbert M. Grosvenor  
August Heckscher  
F. Wayne King  
Peter Matthiessen  
George D. Ruggieri  
George B. Schaller  
Eugene J. Walter, Jr.

## Scholarship Fund

William G. Conway  
F. Wayne King  
John G. Hoare

## Trustee Committee for Friends of the Zoo

David T. Schiff, *Chairman*  
Frederick A. Melhado  
Mrs. Judith C. Symonds

## Aquarium and Osborn Laboratories

**Planning Committee**  
Henry Clay Frick II, *Chairman*  
Peter R. Gimbel  
Nixon Griffis  
Howard Phipps, Jr.  
John Pierrepont

## Exploration and Collection Committee

Landon K. Thorne, Jr.  
*Chairman*  
James Walter Carter  
William G. Conway  
Edwin J. Gould  
Nixon Griffis  
F. Wayne King  
Frank Y. Larkin  
Peter Matthiessen  
G. W. Merck  
Howard Phipps, Jr.  
George D. Ruggieri

## Education Committee

Mrs. Judith C. Symonds  
*Chairman*  
Christopher Angell  
Mrs. Edwin Cohen  
William G. Conway  
Nixon Griffis  
Miss Karen Hensel  
Frank Y. Larkin  
Richard Lattis  
Thomas Leahy  
Gregory Long  
John McKew  
Howard Phipps, Jr.  
David A. Prager  
Mrs. John L. Procope, Jr.  
Arthur Ross  
George D. Ruggieri  
Edward Russell, Jr.  
Mrs. John S. Samuels  
John T. Sargent  
Mrs. George L. Unis  
Mrs. Jenny Bell Whyte



#### Board of Advisors

Robert E. Blum  
James Walter Carter  
John Elliott  
Robert I. Gannon  
Peter Grimm  
David Hunter McAlpin  
Richard T. Perkin  
Mrs. Harmon L. Remmel  
Guy G. Rutherford  
John M. Schiff  
Mrs. Anne H. Stevenson  
Mrs. Joseph A. Thomas  
Miss Alice Tully  
Mrs. George L. Unis  
Mrs. Gerritt P. Van de Bovenkamp

#### Friends of the Zoo

Mrs. George L. Unis  
Chairman

#### Women's Committee

Mrs. Vincent Astor  
Honorary Chairman  
Mrs. Harmon L. Remmel  
Chairman

William G. Conway, *General Director*  
John G. Hoare, *Comptroller*; John  
McKew, *Director of Administrative Services*; Timothy F. O'Sullivan, *Deputy Director of Administration*; Marie Sexton, *Membership Chairman*; Arnold Harlem, *Manager, Visitor Services*; Barbara S. Friedman, *Accounting Manager*; John Sutton, *Chairman & Associate Curator, Exhibition & Graphic Arts*; Robert Greenboam, *Chief Graphic Designer, Exhibition & Graphic Arts*; Gregory Long, *Consultant, Development*; George Nichols, *Private Foundation Coordinator*; Eugene J. Walter, Jr., *Editor & Curator, Publications & Public Relations*; Joan Van Haasteren, *Associate Curator, Publications & Public Relations*; William Meng, *Assistant Curator, Photographic Services*; James A. Oliver, *Director Emeritus*; William Bridges, *Curator of Publications Emeritus*

#### Zoological Park

William G. Conway, *Director*; David Cole, *Deputy Director of Operations*; F. Wayne King, *Director of Zoology*; Joseph Bell, *Deputy Director of Zoology, and Chairman & Curator, Ornithology*; Donald F. Bruning, *Curator, Ornithology*; James G. Doherty, *Curator, Mammalogy*; Mark C. MacNamara, *Assistant Curator, Mammalogy*; John L. Behler, *Curator, Herpetology*; Richard Lattis, *Chairman & Associate Curator, Education*; Annette Berkovits, *Assistant Curator, Education*; Michael Gallo, *Manager, Security*; Joseph McCormick, *Manager, Transportation*; Patricia Higbee Symonds, *Coordinator of Volunteer Services*; Charles B. Driscoll, *Director of Operations Emeritus*; Grace Davall, *Curator Emeritus*; Roland Lindemann, *Consultant, Mammal Management*; Jean Delacour, *Ostrom Enders*; Winston Guest, Jr., *Frank Y. Larkin*; William K. Macy, Jr., *S. Dillon Ripley*; Charles Sivelle, *Charles D. Webster, Field Associates in Ornithology*; Joseph A. Davis, *Field Associate in Mammalogy*; William H. Zovickian, *Field Associate in Herpetology*

#### New York Aquarium

George D. Ruggieri, S.J., *Director*;  
William S. Flynn, *Assistant Director*;  
Kenneth Gold, *Curator, Protista*; Klaus D. Kallman, *Curator, Fishes*; Martin F. Stempien, Jr., *Curator, Invertebrates*;  
Karen Hensel, *Curator, Education*

#### Osborn Laboratories of Marine Sciences

George D. Ruggieri, S.J., *Director & Experimental Embryologist*; Kenneth Gold, *Assistant Director & Marine Ecologist*; Martin F. Stempien, Jr., *Assistant to the Director & Bio-organic Chemist*; Ross F. Nigrelli, *Senior Scientist*; Paul J. Cheung, *Microbiologist*; Klaus D. Kallman, *Fish Geneticist*; Eli D. Goldsmith, *Scientific Consultant*; C. M. Breder, Jr., *Research Associate Ichthyology*; Erwin J. Ernst, *Research Associate, Estuarine & Coastal Ecology*; Myron Jacobs, *Research Associate, Cetacean Neuroanatomy*; Martin P. Schreibmann, *Research Associate, Fish Endocrinology*

#### International Field Science and Conservation

*Center for Field Biology and Conservation*: George Schaller, *Research Zoologist & Coordinator*; Roger S. Payne, *Thomas T. Struhsaker, Research Zoologists*; Donald F. Bruning, *Andrew Laurie, Research Associates*

*Department of Conservation*: F. Wayne King, *Director of Conservation*; David Western, *Resource Ecologist*; Russell A. Mittermeier, *World Wildlife Fund Primate Ecologist*; Walter Auffenberg, *Federico Medem, Stanley A. Temple, Conservation Fellows*; Cristina Palacio, *Staff Conservationist*

#### Wildlife Survival Center

John Lukas, *Assistant Curator in Residence*; Morton Silberman, *Clinical Consultant*; Donald F. Bruning, *Consultant, Ornithology*; James G. Doherty, *Mark C. MacNamara, Consultants, Mammalogy*; Emil P. Dolensek, *Consultant, Animal Health*

#### Animal Health

Emil P. Dolensek, *Veterinarian*; Earl Meyerhenry, *Astor-Thomas Pathology Resident*; Elizabeth Russo, *Veterinary Resident*; Consultants: Alan Belson, *John Budinger, Pathology*; Robert Byck, *Pharmacology*; Harold S. Goldman, *Radiology*; Roy Bellhorn, *Paul Henkind, Alan Friedman, Comparative Ophthalmology*; Lucy Clausen, *Parasitology*; Theodore Kazimiroff, *Dentistry*; Henry Clay Frick II, *Susan Williamson, Obstetrics & Gynecology*; Richard Lee, *Internal Medicine*; Thomas Blumenfeld, *Pediatrics*; Jacques Wallach, *Clinical Pathology*; Raymond Napolitano, *Protozoology*

## Contributions of \$1,000 and over, January 1 - December 31, 1977

ACF Foundation Inc.	The Eppley Foundation for Research, Inc.	Mr. & Mrs. George W. Merck
Affiliated Hospital Products, Inc.	The T. M. Evans Foundation	Merck Family Fund
Douglas H. Alexander	The Explorers Club	The Charles E. Merrill Trust
Allied Chemical Foundation	Exxon Corporation	Metropolitan Life Insurance Company
American Express Foundation	Mr. & Mrs. William Ward Foshay	James F. Miller
American-Standard Foundation	Foundation for the Needs of Others, Inc.	Morgan Guaranty Trust Company of
American Telephone and Telegraph Company	William V. Frankel Animal Preservation Foundation	New York Charitable Trust
The Arkville Erpf Fund Inc.	F. William Free & Co., Inc.	Morgan Stanley Foundation
Associated Dry Goods Corporation	Freeport Minerals Company	Barclay Morrison
Mrs. Vincent Astor	Dr. & Mrs. Henry Clay Frick II	Stewart Rawlings Mott
The Vincent Astor Foundation	The Estate of Elizabeth F. Gamble	Muskiwinni Foundation
Avon Products Foundation, Inc.	Paul E. Geier	Newsweek
Anthony K. Baker	General Foods Corporation	The New York Community Trust
George F. Baker	Mr. & Mrs. Benjamin D. Gilbert	New York News-Joseph M. Patterson Charitable Foundation
George F. Baker, III	Gilman Foundation Inc.	New York Seven-Up Bottling Co., Inc.
The George F. Baker Trust	Bernard F. and Alva B. Gimbel Foundation	The New York Times Company
Bankers Trust Company	Peter R. Gimbel	Foundation, Inc.
Robert R. Barker	Mrs. D. Coleman Glover	Margaret R. Nicholas
The Barker Welfare Foundation	Robert G. Goelt	Nichols Foundation, Inc.
The Frederick W. Beinecke Fund	Sybil and William T. Golden Foundation	Edward John Noble Foundation
The Siegfried and Josephine Bieber Foundation	Grace Foundation Inc.	North American Reinsurance Corporation
Mr. & Mrs. Robert E. Blum	The Griffith Foundation, Inc.	Jessie Smith Noyes Foundation, Inc.
The Elmer & Mamdouha Bobst Foundation, Inc.	Peter Grimm	Mr. & Mrs. John Merrill Olin
The Bodman Foundation	The Paul Guenther Fund	Augustus G. Paine
Borden Foundation, Inc.	The Guinzburg Fund	Mrs. Marcel A. Palmaro
The Albert C. Bostwick Foundation	Gulf + Western Foundation	The Perkin Fund
Helen W. Buckner	Henry B. Guthrie	Bernard Peyton, III
Mr. & Mrs. Claus von Bulow	Haskins & Sells	Pfizer Inc.
George A. Burrell	Enid A. Haupt Charitable Trust	Philip Morris Incorporated
Mr. & Mrs. Douglass Campbell	Charles Hayden Foundation	Howard Phipps Family Charitable Foundation
Capital Cities Foundation Inc.	William Randolph Hearst Foundation	Mr. & Mrs. Howard Phipps, Jr.
Caravan Products Company Inc.	Mrs. George L. Hinman	John Pierpont
Mr. & Mrs. James Walter Carter	Audrey P. Holden Charitable Trust	The Pleasant Street Foundation
Carter Fund	Geoffrey Chambers Hughes	Mrs. John L. Procopie, Jr.
Guy F. Cary	Patricia K. Hurd Trust	Eben W. Pyne
Celanese Corporation	The IFF Foundation Inc.	Readers's Digest Foundation
Dorothy Jordan Chadwick Fund	International Business Machines Corporation	Rembrandt Fund
The Chase Manhattan Bank, N.A.	International Ladies' Garment Workers' Union	Revlon Foundation Inc.
Chemical Bank	International Paper Company Foundation	R. J. Reynolds Industries, Inc.
Citibank, N.A.	International Telephone and Telegraph Corporation	Laurance S. Rockefeller
The Clark Foundation	The Irwin Family	Rockefeller Center, Inc.
Consolidated Edison Company of New York, Inc.	J. I. Foundation, Inc.	Helena Rubinstein Foundation, Inc.
Consumer's Carpet Workroom Co., Inc.	Mr. & Mrs. Gilbert E. Jones	The Rudin Foundation Inc.
Cooley's Anemia Blood & Research Foundation for Children Inc.	Kings County Democratic County Committee	George D. Ruggieri
Ida Coppola	F. M. Kirby Foundation, Inc.	The William R. and Virginia F. Salomon Family Foundation, Inc.
Culbro Corporation	Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation	John T. Sargent
Louise B. and Edgar M. Cullman Foundation	The Estate of Edward H. Kuehn	Stanley J. Sarnoff
Mr. & Mrs. Allerton Cushman	L.A.W. Fund, Inc.	The Scherman Foundation, Inc.
Cyclone Coaster Inc.	Frank Y. Larkin	The Schiff Foundation
D'Agostino Supermarkets	Alexander M. and Judith W. Laughlin Foundation	Mrs. Charles B. Scully
Mrs. Charles A. Dana, Jr.	Mr. & Mrs. William K. Laughlin	Charitable Income Trusts established by Mrs. Marilyn M. Simpson
Harry De Jur Foundation, Inc.	Lehman Brothers Kuhn Loeb Incorporated	Sirena Restaurant, Inc.
Alfonso DeMatteis	Lever Brothers Foundation, Inc.	The Estate of Irene Hayes Solomon
Geraldine R. Dodge Foundation, Incorporated	Mr. & Mrs. John H. Livingston	The South Branch Foundation
Dollar Savings Bank of New York	The Joe and Emily Lowe Foundation, Inc.	The Seth Sprague Educational and Charitable Foundation
Doubleday & Company, Inc.	Dan W. Lufkin	The Starr Foundation
The Dover Fund, Inc.	Mr. & Mrs. David Hunter McAlpin	The Stebbins Fund
The Downe Foundation	John D. Macomber	Stoevers Glass & Co. Incorporated
The Doris Duke Foundation	The Mandeville Foundation Inc.	Mrs. William E. Strahl
The Dunlevy Milbank Foundation, Inc.	Mr. & Mrs. Hayward F. Manice	Mrs. Roger W. Straus
The Ferdinand Eberstadt Foundation, Inc.	Otto Marx, Jr.	Mrs. Arthur Hays Sulzberger
Blanche T. Enders Trust	Peter Matthiessen	Texaco Inc.
Ostrom Enders	Cordelia S. May Charitable Trust	Thayer Lindsley Trust
The Charles Engelhard Foundation	Helen S. Mayer Charitable Trust	The Estate of Joseph A. Thomas
Engelhard-Hanovia, Inc.	Mayer Family Foundation	The Thorne Foundation
Engelhard Minerals & Chemicals Corporation	The Andrew W. Mellon Foundation	The Oakleigh L. Thorne Foundation
	Mrs. Ward Melville	Time Incorporated
		The Estate of Lorraine C. Tobin
		Tudor Foundation, Inc.

Alice Tully  
Union Carbide Corporation  
United Industrial Corporation  
Universal Leaf Foundation  
The G. Unger Vetlesen Foundation  
Lila Acheson Wallace  
Thomas J. Watson, Jr.  
Mr. & Mrs. Charles D. Webster  
Whitehall Foundation, Inc.  
The H. W. Wilson Foundation Inc.  
Mr. & Mrs. Robert W. Wilson Foundation  
Mrs. Albert E. Winger  
Trust Under Agreement with Robert  
Winthrop for Charity  
Wood, Struthers & Winthrop Inc.  
Wyssmont Co., Inc.  
Mrs. Alfred J. Yardley  
The Yorkshire Fund  
Nicholas D. Zigo  
Seven Anonymous Gifts

Champion International Corporation

---

### **Recommended Form of Bequest**

The Trustees of the Society recommend that for estate planning purposes, members and friends consider the following language for use in their Wills:

“To the New York Zoological Society, a not-for-profit, tax-exempt membership organization incorporated by the laws of the State of New York in 1895, having as its principal address the New York Zoological Park, Bronx, New York 10460, I hereby give and bequeath \_\_\_\_\_ for the Society’s general purposes.”

If you want to restrict your bequest, please be in touch with Gregory Long of the Development Office, (212) 220-5090. In order to prevent the Society from incurring future administrative costs, it would be helpful if you would consider the addition of the following language to any restrictions which you may wish to impose on your bequest:

“If at some future time, in the judgment of the Trustees of the New York Zoological Society, it is no longer practicable to use the income or principal of this bequest for the purposes intended, the Trustees have the right to use the income or principal for whatever purpose they deem necessary and most closely in accord with the intent described herein.”

Howard Phipps, Jr.  
President

---







